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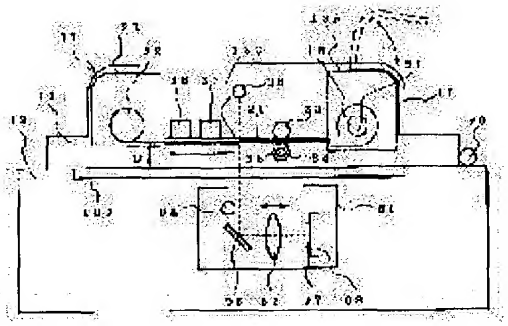
(54) IMAGE READER AND TRANSMISSION ORIGINAL ADAPTER

(57)Abstract:

PROBLEM TO BE SOLVED: To easily read the images of a long film by carrying the long film along an original mounting surface by a carrying means and illuminating the long film from a direction for projecting the original mounting surface by an illumination means.

SOLUTION: Only by rotation with the fine interval of a scanning roller 34 by a stepping motor 35, a roll film 21 is moved with a fixed fine interval to an optical block 51. By the movement, a line sensor 97 is finely moved in a feeding direction relatively to the film 21. At a prescribed position above a virtual roll film feeding surface 13c, an illumination light source 38 is fixed, a white light source is used for the light source 38 and an optical system is provided between the light source 38 and the feeding surface 13c. The optical system linearly irradiates the image storage area of the film 21 to be fed at the time of loading a cartridge 15 by the luminous flux of the light source 38 of linear light emission. Thus, the original images of the film 21 are image- formed on the light receiving surface of the line sensor 97.



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* NOTICES *

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention] This invention relates to the transparency manuscript adapter with which the image reader and it which read a manuscript image are equipped.
[0002]
[Description of the Prior Art] The image reader which reads manuscript images, such as a photograph and a document, is known as an image scanner. An image scanner reads a manuscript image in response to the command from the host computer which is high order equipment, and outputs it to a host computer. A host computer displays the read image on monitor display.
[0003] There is a flatbed scan type thing (henceforth a "flat-bed scanner") which reads the manuscript (reflection copy) which does not mainly penetrate light in an image scanner. The general configuration of the conventional flat-bed scanner 90 is shown in drawing 11 . In drawing 11 , the conventional flat-bed scanner 90 consists of an image read station 91 and a protection-from-light lid 92. The protection-from-light lid 92 is fabricated by the wrap configuration in the platen glass 100 whole arranged at the top-face side of the image read station 91, is one of them and is attached in the image read station 91 free [rotation] by the hinge 99.
[0004] Where the protection-from-light lid 92 is opened, when a deer is carried out, and the reflection copy concerned is laid on platen glass 100 so that the image reading side may become downward and closes the protection-from-light lid 92 after that first at the time of reading of a reflection copy, it is stuck to a reflection copy in the manuscript installation side of platen glass 100. At this time, the protection-from-light lid 92 can also protect the incidence of the outdoor daylight inside the image read station 91.
[0005] On the other hand, in the image read station 91, the optical block 93 is established under the platen glass 100. This optical block 93 is moved along with platen glass 100 by the optical block actuator which is not illustrated. The source 94 of the illumination light which illuminates the reflection copy on platen glass 100, the reflective mirror 95, the projection lens 96, a line sensor 97, and the substrate 98 that mounts a line sensor 97 are formed in the optical block 93.
[0006] as the source 94 of the illumination light -- a line -- the light for which the light source of luminescence was used and which was irradiated from this source 94 of the illumination light illuminates the reflection copy on platen glass 100 in the shape of a line, after the flux of light is adjusted according to the optical system which is not illustrated. The light (reflected light) reflected with the reflection copy at this time reaches the light-receiving side of a line sensor 97 through the projection lens 96, after being reflected by the reflective mirror 95. A deer is carried out and image formation of the manuscript image on a reflection copy is carried out in respect of this light-receiving.
[0007] In one dimension, two or more optoelectric transducers are arranged and the charge (the light figure was embraced) according to the strength of the reflected light which expresses a manuscript image with these optoelectric transducers is accumulated in the light-receiving side of a line sensor 97. Therefore, (horizontal scanning) and the image information of one line (one line along a main scanning

direction) are read by carrying out the sequential transfer of the charge accumulated in each of the optoelectric transducer arranged in one dimension separately, and performing that signal processing based on this charge.

[0008] Moreover, the optical block 93 with which a line sensor 97 is formed is moved in the vertical direction (the direction of vertical scanning) to the array direction of the optoelectric transducer of the line sensor 97 concerned. While a line sensor 97 performs the above-mentioned reading actuation of the image information (line data) of one line, it will be moved in the vertical direction to the array direction of an optoelectric transducer by migration of this optical block 93, and it can read the manuscript image expressed by migration (vertical scanning) of this perpendicular direction by the reflection copy on platen glass 100 (graphic display abbreviation) two-dimensional by it.

[0009] In such a flat-bed scanner 90 for reflection copy reading, transparency manuscripts, such as 35mm film photoed with the camera, can also be read by replacing with the protection-from-light lid 92, and equipping with the transparency manuscript adapter uniquely equipped with the source of the illumination light. Although a transparency manuscript adapter is not shown in drawing, a wrap configuration fabricates the platen glass 100 whole of the image read station 91 like the protection-from-light lid 92.

[0010] For example, when reading 35mm film, this 35mm film is directly laid on the manuscript installation side of platen glass 100 like the case of a reflection copy. At this time, the source 94 of the illumination light of the optical block 93 is switched off, and the original source of the illumination light of a transparency manuscript adapter is turned on. The light which penetrated 35mm film at the time of this burning is led to the optical block 93, and image formation of the image on 35mm film is carried out to the light-receiving side of a line sensor 97.

[0011] In addition, if what illuminates a transparency manuscript (for example, 35mm film) in the shape of a field is used as a source of the illumination light prepared original with a transparency manuscript adapter side, the image of the transparency manuscript laid in platen glass 100 can be read two-dimensional only by moving the optical block 93 like the time of reading a reflection copy.

[0012]

[Problem(s) to be Solved by the Invention] By the way, the film system (APS) of a new rank is proposed in recent years. The long film (henceforth a "roll film") with which the new rank film used for this APS has a magnetic storage field is contained inside the cartridge after development. For this reason, a user will deal with this roll film, not touched a roll film directly and contained in a cartridge also after development.

[0013] Thus, since it is contained by the cartridge also in also after a roll film's developing negatives in APS, the image on a roll film cannot be read as it is by the flat-bed scanner by the same approach as 35mm film which was described above. That is, if it is going to read the image on a roll film by the flat-bed scanner, it will be necessary to prepare the function (feed function) to send out the roll film contained by the cartridge from this cartridge by a certain approach in a flat-bed scanner. As for especially the send of this roll film, it is desirable to be automatically carried out so that reading of the image concerned may become easy.

[0014] However, it was only assuming reading of 35mm film etc., and the conventional transparency manuscript adapter used in case a transparency manuscript is read by the flat-bed scanner 90 mentioned above was not able to read the image on this roll film, feeding with a roll film. The 1st object of this invention is in the image reader which reads the image of a reflection copy to offer the transparency manuscript adapter with which the image reader and it which can read the image of a roll film easily are equipped.

[0015] In the image reader which reads the image of a reflection copy, even if the 2nd object of this invention is the case where it feeds with the roll film concerned at the time of reading of the image of a roll film, it is to offer the transparency manuscript adapter with which the image reader and it which can read without damaging the film plane are equipped.

[0016]

[Means for Solving the Problem] Invention according to claim 1 is equipped with the transparency

manuscript adapter which has a lighting means illuminate from the direction which projects the manuscript installation base which lays a manuscript in an image reader, a reading means read the image of a manuscript, a conveyance means it is prepared in the manuscript installation side side of a manuscript installation base removable, and convey the long film which is a transparency manuscript along a manuscript installation side, and a long film on a manuscript installation side.
[0017] When invention according to claim 2 has further a migration means to move a reading means along a manuscript installation base, in an image reader according to claim 1, a migration means makes a reading means stand it still in an orientation and a conveyance means conveys a long film, a reading means reads the image of a long film. When invention according to claim 3 has further a migration means to move a reading means along a manuscript installation base, in an image reader according to claim 1, the image storage region where a conveyance means is set as the reading object of a long film is set as an orientation and a migration means moves a reading means, a reading means reads the image of a long film.
[0018] While invention according to claim 4 is equipped with a photo-electric-translation means to change into a picture signal the light to which the reading means of an image reader according to claim 1 is arranged, and carries out incidence of the image light of a manuscript to the image formation location of the image formation optical system which carries out image formation, and image formation optical system When this reading means reads the image of a long film, it has further an accommodation means to adjust the optical physical relationship of the forming face of the image storage region of a long film and the light-receiving side of a photo-electric-translation means about image formation optical system.
[0019] As for invention according to claim 5, the image of the image storage region of a long film doubles the image formation location of image formation optical system with the location as for which the accommodation means of an image reader according to claim 4 carries out image formation to the light-receiving side of a photo-electric-translation means according to image formation optical system.
Invention according to claim 6 is equipped with a conveyance means convey the long film which is a transparency manuscript along a manuscript installation side to the transparency manuscript adapter formed in the manuscript installation side side of the manuscript installation base of an image reader equipped with the manuscript installation base in which a manuscript is laid, and a reading means read the image of a manuscript, removable, and a lighting means illuminate from the direction which projects a long film on a manuscript installation side.
[0020] The conveyance means of a transparency manuscript adapter according to claim 6 maintains a long film, and, as for invention according to claim 7, conveys a manuscript installation side to predetermined distance for it. Invention according to claim 8 equips a transparency manuscript adapter according to claim 6 with a film centering-control means to adjust the location of the long film to a manuscript installation side. When this film centering-control means holds a long film in the condition of having deserted the manuscript installation side when a conveyance means conveys a long film, and a reading means reads the image of a long film, a long film is held in the condition of having pushed against the manuscript installation side.
[0021] A transparency manuscript adapter according to claim 6 is equipped with the mask member which is arranged on a manuscript installation side and has opening into the part corresponding to the image storage region of a long film at least when an image reader is equipped, and a conveyance means maintains a long film and, as for invention according to claim 9, conveys a larger predetermined distance than the thickness of a manuscript installation side to a mask member for it.
[0022] Invention according to claim 10 to a transparency manuscript adapter according to claim 6 The mask member which is a mask member arranged on a manuscript installation side, and has opening into the part corresponding to the image storage region of a long film at least when an image reader is equipped, Have a film centering-control means to adjust the location of the long film to a mask member, and when a conveyance means conveys a long film, this film centering-control means When a long film is held in the condition of having deserted the mask member and a reading means reads the image of a long film, a long film is held in the condition of having pushed against the mask member.
[0023] A transparency manuscript adapter according to claim 6 is equipped with the light transmission

nature member by which it is arranged on a manuscript installation side, and anti newton processing is performed to the part corresponding to the image storage region of a long film at least when an image reader is equipped, and a conveyance means maintains a long film and, as for invention according to claim 11, conveys a larger predetermined distance than the thickness of a manuscript installation side to a light transmission nature member for it.

[0024] Invention according to claim 12 to a transparency manuscript adapter according to claim 11 Have a film centering-control means to adjust the location of the long film to a light transmission nature member, and when a conveyance means conveys a long film, this film centering-control means When a long film is held in the condition of having deserted the light transmission nature member and a reading means reads the image of a long film, a long film is held in the condition of having pushed against the light transmission nature member.

[0025] Invention according to claim 13 equips the film centering-control means of a transparency manuscript adapter given in any of claim 8, claim 10, and claim 12 they are with the protection-from-light member by which the light transmission section is formed in the part corresponding to the image storage region of a long film. Invention according to claim 14 equips a transparency manuscript adapter according to claim 6 with a magnetic information reading means to read magnetic information in the magnetic storage field of a long film.

[0026] the line to which the lighting means of a transparency manuscript adapter according to claim 6 moves invention according to claim 15 synchronizing with migration of a reading means -- it has the light source of luminescence. As for invention according to claim 16, the lighting means of a transparency manuscript adapter according to claim 6 is equipped with the light source of field-like luminescence. As for invention according to claim 17, the magnetic information reading means of a transparency manuscript adapter according to claim 14 is formed in the lighting side side of a long film.

[0027] Invention according to claim 18 equips a transparency manuscript adapter according to claim 6 with the magnetic information write-in means which writes in magnetic information to the magnetic storage field of a long film. As for invention according to claim 19, the magnetic information write-in means of a transparency manuscript adapter according to claim 18 is formed in the lighting side side of a long film.

[0028] (Operation) According to invention according to claim 1, a long film can be conveyed along a manuscript installation side with the conveyance means with which the transparency manuscript adapter formed in the manuscript installation side side of a manuscript installation base removable was equipped, and a reading means can read now the manuscript image on the long film concerned with illuminating from the direction which projects a long film on a manuscript installation side with a lighting means by one side. In this case, the reading means described above when laying the reflection copy in the manuscript installation base can also read the manuscript image on the reflection copy concerned.

[0029] According to invention according to claim 2, a long film with a light conveyance means is conveyed. Therefore, even if equipment according to claim 2 uses the small thing of the force for a conveyance means, it becomes possible [conveying a long film at a high speed]. Therefore, the equipment which reads the image of a long film at a high speed cheaply is offered. According to invention according to claim 3, a migration means carries out to moving a reading means relatively to a long film. Therefore, equipment according to claim 3 does not need to form other migration means for image reading in conventional equipment separately. Therefore, the equipment which reads the image of a long film cheaply is offered.

[0030] According to invention according to claim 4, since an adjustment means adjusts the optical physical relationship of the forming face of the image storage region of a long film and the light-receiving side of a photo-electric-translation means about image formation optical system, the manuscript image on this image storage region can be read irrespective of the location of the forming face of the image storage region of the long film by the side of a transparency manuscript adapter. Since according to invention according to claim 5 the image formation location is adjusted so that image formation of the image of the image storage region of a long film may be carried out for an adjustment

means to the light-receiving side of a photo-electric-translation means, the manuscript image on this image storage region can be vividly read irrespective of the location of the forming face of the image storage region of the long film by the side of a transparency manuscript adapter.
[0031] According to invention according to claim 6, a long film can be conveyed along a manuscript installation side only by equipping an image reader with the transparency manuscript adapter concerned with the conveyance means with which this transparency manuscript adapter was equipped, and a reading means can read now the manuscript image on the long film concerned with illuminating from the direction which projects a long film on a manuscript installation side with a lighting means by one side.
[0032] According to invention according to claim 7, since the conveyance means of a transparency manuscript adapter maintains predetermined distance and conveys a long film from a manuscript installation side, it is lost that a long film and a manuscript installation side touch at the time of the conveyance, and it is lost that a blemish is attached to the film plane of a long film.
[0033] Since it holds in the condition that the film centering-control means held the long film in the condition of having deserted the manuscript installation side, at the time of conveyance, read the image by the reading means, and sometimes pushed the long film concerned in the manuscript installation side according to invention according to claim 8, it is lost that a blemish is attached to the film plane of a long film at the time of conveyance, and the manuscript image on a long film can be vividly read at the time of reading.
[0034] Since according to invention according to claim 9 a conveyance means conveys a long film in the condition of not touching this mask member, at the time of the conveyance even if it is the case where the manuscript image concerned is read using the mask member pressed against the long film concerned after the opening has corresponded to the image storage region of a long film at the time of manuscript image reading on a long film, it is lost that a blemish is attached to the film plane of a long film.
[0035] Since it holds in the condition that the film centering-control means held the long film in the condition of having deserted the mask member, at the time of conveyance, read the image by the reading means, and sometimes pushed the long film concerned at the mask member according to invention according to claim 10, it is lost that a blemish is attached to the film plane of a long film at the time of conveyance, and the manuscript image on a long film can be vividly read at the time of reading.
[0036] Since according to invention according to claim 11 anti Newton ring processing is performed to the part corresponding to said image storage region of a light transmission nature member and the light transmission nature member concerned is pressed against a long film at the time of reading, even if few clearances are generated between the long film and this light transmission nature member, interference of the light resulting from this clearance is pressed down, and the manuscript image concerned can be read vividly. And at the time of the conveyance, since a conveyance means conveys a long film in the condition of not touching this light transmission nature member, it becomes, without attaching a blemish to the film plane of a long film.
[0037] Since it holds in the condition that the film centering-control means held the long film in the condition of having deserted the light transmission nature member, at the time of conveyance, read the image by the reading means, and sometimes pushed the long film concerned at the light transmission nature member according to invention according to claim 12, it is lost that a blemish is attached to the film plane of a long film at the time of conveyance, and the manuscript image on a long film can be vividly read at the time of reading.
[0038] According to invention according to claim 13, about the image storage region of the long film concerned, since the film centering-control means consists of protection-from-light members by which the light transmission section is formed in the part corresponding to the image storage region of a long film, since abbreviation fixed distance is kept maintained to a manuscript installation base, clear reading of the manuscript image of an image storage region becomes possible. According to invention according to claim 14, we decided to equip the transparency manuscript adapter which became independent of the body of an image reader with a magnetic information reading means to read the magnetic information on the magnetic storage field of a long film. Therefore, with equipment according to claim 14, the effect of

the noise received from the electric circuit within the body of an image reader becomes small as compared with the case where a magnetic information reading means is arranged in the body of an image reader. Therefore, reading of the good magnetic information on a S/N ratio becomes possible.
[0039] the line which moves a lighting means synchronizing with migration of a reading means according to invention according to claim 15 -- since it is considering as the light source of luminescence, power consumption in the light source can be lessened. According to invention according to claim 16, since the lighting means is made into the light source of field-like luminescence, it is not necessary to have the means to which the light source concerned is moved, and the configuration of a transparency manuscript adapter can be made simple.
[0040] According to invention according to claim 17, since the magnetic information reading means was formed in the lighting side side of a long film, this magnetic information reading means does not become the hindrance of image reading of a long film. According to invention according to claim 18, we decided to equip the magnetic storage field of a long film with the magnetic information write-in means which writes in magnetic information at the transparency manuscript adapter which became independent of the body of an image reader. Therefore, with equipment according to claim 18, the effect of the noise received from the electric circuit within the body of an image reader becomes small as compared with the case where a magnetic information write-in means is arranged in the body of an image reader. Therefore, the writing of the good magnetic information on a S/N ratio is attained.
[0041] According to invention according to claim 19, since the magnetic information write-in means was formed in the lighting side side of a long film, this magnetic information write-in means does not become the hindrance of image reading of a long film.
[0042]
[Embodiment of the Invention] Hereafter, the operation gestalt of this invention is explained with reference to a drawing.
[0043] (The 1st operation gestalt) Drawing 1 is the external view showing the image reading structure of a system containing the flat-bed scanner 11 which carries out this invention. Drawing 2 is the roll film 21 with which a flat-bed scanner 11 is loaded, and the external view of a cartridge 15. Drawing 3 is the cross-section perspective drawing showing the internal configuration of the flat-bed scanner 11 of the 1st operation gestalt. Drawing 4 is the block diagram showing the electric configuration of the flat-bed scanner 11 of the 1st operation gestalt. In addition, the 1st operation gestalt corresponds to claims 1 and 2, claim 4 - claim 7, claims 14 and 15, and invention according to claim 17 to 19.
[0044] In drawing 1 , the flat-bed scanner 11 of the 1st operation gestalt consists of an image read station 12 and a transparency manuscript adapter 13, and the host computer 14 is connected to this flat-bed scanner 11. The flat-bed scanner 11 of this 1st operation gestalt can also read the image on the roll film 21 it not only reads the image of a reflection copy like the conventional flat-bed scanner, but further contained by the cartridge 15 shown in drawing 2 . Therefore, the lid which shades the top face of the image read station 12 consists of transparency manuscript adapters 13. The conveyance device is prepared in this transparency manuscript adapter 13 that reading of the image on the roll film 21 concerned should be made easy so that it may mention later for details.
[0045] The transparency manuscript adapter 13 is one of them, and like closing motion of the conventional protection-from-light lid, the top face of platen glass 100 (refer to drawing 3) in which a reflection copy is laid appears, or it is covered by the transparency manuscript adapter 13 concerned by being attached in the image read station 12 free [rotation], and opening and closing this transparency manuscript adapter 13 with a hinge 99. In addition, the image read station 12 is equipped with the transparency manuscript adapter 13 possible [desorption].
[0046] Moreover, the closing motion lid 16 is formed in the transparency manuscript adapter 13 at a top-face side. This closing motion lid 16 leads to cart room 13A in the transparency manuscript adapter 13 loaded with the cartridge 15 shown in drawing 2 (refer to drawing 3). Here, the roll film 21 contained by the cartridge 15 and this with which said cart room 13A is loaded is explained using drawing 2 .
[0047] The slit-like opening 27 is formed in the side of the cylinder-like case 26 at the cartridge 15. Moreover, the cartridge spool 28 is supported to revolve by the amount of [of a case 26] axial core free

[a revolution]. The end face is fixed to the cartridge spool 28, and, on the whole, the roll film 21 is rolled round by the cartridge spool 28 at the time of receipt into a case 26. Thus, the contained roll film 21 is sent out in the direction shown in drawing 2 by the arrow head when the cartridge spool 28 rotates (forward revolution) from a cartridge 15 from opening 27, and if the cartridge spool 28 rotates to hard flow (counterrotation), it will be rewound by the cartridge 15.

film info

[0048] The image storage region 22, two perforation 23 and 24, and magnetic storage fields 25 are formed in this roll film 21 for every coma. The information about photography of a coma number, a title, photography time, photography conditions, assignment print size, etc. is recorded on each magnetic storage field 25. In addition, two perforation 23 and 24 is to show the starting position and termination location of the image storage region 22 of a roll film 21.

[0049] Next, the concrete internal configuration of the flat-bed scanner 11 of the 1st operation gestalt is explained using drawing 3 and drawing 4 . In addition, although the flat-bed scanner 11 of the 1st operation gestalt can read the manuscript image of both a reflection copy (graphic display abbreviation) and the roll film 21 as mentioned above, the condition of having loaded the transparency manuscript adapter 13 with the roll film 21 is shown in drawing 3 and drawing 4 for convenience.

[0050] As shown in drawing 3 , platen glass 100 is arranged on the top face of the image read station 12 which constitutes a flat-bed scanner 11. That whole surface is covered by the transparency manuscript adapter 13 by which this platen glass 100 was attached in the image read station 12 with the hinge 99 (when it is in the condition which this transparency manuscript adapter 13 closed).

[0051] Cart room 13A by which the transparency manuscript adapter 13 loads the interior with a cartridge 15, and film storage space 13B for containing the roll film 21 with which it is sent out from a cartridge 15 at the time of loading in the exterior are divided. Among this, the fork shaft 39 which engages with the cartridge spool 28 concerned at the time of loading of a cartridge 15, and DC motor 31 (refer to drawing 4) which carries out revolution actuation of this fork shaft 39 are formed in cart room 13A.

[0052] Moreover, the receiving spool 32 for rolling round the roll film 21 sent out from the cartridge 15 is formed in film storage space 13B. The revolving shaft of a receiving spool 32 is connected through the gear mechanism which is not illustrated by the revolving shaft of DC motor 31. For this reason, at the time of revolution actuation of DC motor 31, the fork shaft 39 and a receiving spool 32 interlock, and are rotated.

[0053] Therefore, at the time of loading of a cartridge 15, if revolution actuation of DC motor 31 is carried out (forward revolution), a roll film 21 will be sent out from a cartridge 15. This sent-out roll film 21 is rolled round by the receiving spool 32. Conveyance of the roll film 21 from cart room 13A to film storage space 13B at this time is performed at a comparatively quick rate (feed of a roll film 21).

[0054] In this case, each attaching position is determined so that imagination field (henceforth "roll film feed side") 13C to which a roll film 21 passes the above-mentioned fork shaft 39 and the above-mentioned receiving spool 32 at the time of feed so that the film plane of a roll film 21 may not touch the top face (manuscript installation side) of platen glass 100 at the time of feed may separate only the predetermined distance D from the top face (manuscript installation side) of said platen glass 100.

[0055] Furthermore, the tension roller 33 and the scanning roller 34 are formed in the interior of the transparency manuscript adapter 13. A tension roller 33 and the scanning roller 34 move this in the same direction as the conveyance direction (the feed direction) of the roll film 21 at the time of feed in the shape of a step minutely, inserting a roll film 21 at the time of loading of a cartridge 15.

[0056] These tension rollers 33 and the scanning roller 34 are arranged so that it may counter mutually to above mentioned roll film feed side 13C. Among these, the stepping motor 35 which carries out revolution actuation of this at detailed spacing at the shape of a step is connected with the scanning roller 34. Therefore, in loading with a cartridge 15 and reading the manuscript image of the roll film 21 concerned, it stops the feed by above-mentioned DC motor 31. And a roll film 21 is moved in the feed direction in the shape of a step at detailed fixed spacing to the optical block 51 mentioned later only by revolution actuation at detailed spacing of the scanning roller 34 by the stepping motor 35 (micromigration).

[0057] The line sensor 97 by the side of the optical block 51 mentioned later will be relatively moved minutely in the feed direction in the shape of a step to the roll film 21 concerned by the micromigration of the shape of a step of this roll film 21. The scan (vertical scanning) of the manuscript image mentioned later is performed by the relative micromigration at this time. In this case, the feed direction and the direction of vertical scanning of a roll film 21 are in agreement.
[0058] Moreover, the sensor 36 for film location detection and the magnetic head 37 are formed in the above-mentioned upper part of imagination roll film feed side 13C. Among these, the sensor 36 for film location detection is arranged in the location where the formation side of the perforation 23 and 24 of a roll film 21 approaches this at the time of loading of a cartridge 15, as shown in drawing 4 . Moreover, the magnetic head 37 is arranged in the location where the formation side of the magnetic storage field 25 of a roll film 21 approaches this at the time of loading of a cartridge 15, as shown in this drawing.
[0059] Furthermore, the source 38 of the illumination light is fixed and established in the upper imagination predetermined location of roll film feed side 13C. as the source 38 of the illumination light -- this 1st operation gestalt -- a line -- the source of the white light of luminescence is used. Moreover, the optical system which is not illustrated prepares between the source 38 of the illumination light, and said roll film feed side 13C, and it is ********. this optical system -- a line -- the image storage region 22 of the roll film 21 with which it is fed at the time of loading of a cartridge 15 is irradiated in the shape of a line (one line) according to the flux of light of the source 38 of the illumination light of luminescence. Here, the direction of a line concerned of the flux of light which irradiates the image storage region 22 in the shape of a line (direction of radiation) intersects perpendicularly in the feed direction of the above-mentioned roll film 21.
[0060] On the other hand, inside the image read station 12 (lower part of platen glass 100), as shown in drawing 3 and drawing 4 , the optical block 51 is arranged. The source 94 of the illumination light, the reflective mirror 95, the projection lens 52, a line sensor 97, and the substrate 98 that mounts a line sensor 97 are formed in the optical block 51. among these, the source 38 of the illumination light of the transparency manuscript adapter 13 which the source 94 of the illumination light is for illuminating the reflection copy laid on platen glass 100 at the time of reading of a reflection copy, and was described above -- the same -- a line -- the source of the white light of luminescence is used.
[0061] Moreover, the projection lens 52 carries out image formation of the light from a manuscript to the light-receiving side of a line sensor 97. In addition, this projection lens 52 adjusts the reflected light after resulting [from the source 94 of the illumination light] in a reflection copy at the time of reading of a reflection copy, and carries out image formation of the manuscript image on a reflection copy at it. Moreover, at the time of reading of the roll film 21 of a cartridge 15, the light which has penetrated the roll film 21 concerned is adjusted, and image formation of the manuscript image on a roll film 21 is carried out at it. This projection lens 52 is moved in that direction of an optical axis (direction shown by the drawing 3 Nakaya mark) by revolution of the motor which is not illustrated, for example.
[0062] moreover, the line sensor 97 -- the source 38 of the illumination light, and the source 94 of the illumination light -- above -- a line -- as green as the image sensors for red, when it consists of sources of the white light of luminescence -- it consists of three line sensors which consist of image sensors of **, and image sensors for blue. In this case, that light-receiving side is formed in two or more optoelectric transducers arranged in one dimension along with the direction of radiation (direction of one line) which described each image sensors above. Thus, in the image sensors with which two or more optoelectric transducers were arranged, the charge (the light figure was embraced) according to the strength of the light (a manuscript image is expressed) by which incidence was carried out to these optoelectric transducers is respectively accumulated in one dimension. Therefore, (horizontal scanning) and the image information of one line are read by carrying out the sequential transfer of the charge accumulated in each of the optoelectric transducer arranged in one dimension separately, and performing the signal processing based on a charge.
[0063] As shown in drawing 4 , the belt 54 for moving this is attached in the optical block 51 of this configuration. On the other hand, the pulley 55 and another pulley which is not illustrated are installed in the case of the image read station 12. The suspension of the belt 54 is carried out to a pulley 55 and

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another pulley (not shown), and moderate tension is given. The stepping motor 53 which carries out revolution actuation of this at detailed spacing at the shape of a step is formed in one pulley 55.
[0064] Therefore, the optical block 51 is moved in the direction of vertical scanning (direction which goes to the axis of a line sensor 97 direct) in the shape of a step at detailed fixed spacing to the above-mentioned platen glass 100 by carrying out revolution actuation of the pulley 55 with a stepping motor 53 at the time of reading of a reflection copy (micromigration).
[0065] In addition, at the time of reading of a roll film 21, since it is fixed in the location (reading orientation) which is in agreement with the optical axis of the flux of light of the source 38 of the illumination light which the optical axis of the projection lens 52 described above, a stepping motor 53 does not rotate the optical block 51. In the flat-bed scanner 11 constituted as mentioned above, micromigration of the optical block 51 is carried out to the shape of a step by revolution actuation of a stepping motor 53 in the direction of vertical scanning as mentioned above at the time of reading of a reflection copy. Micromigration of the line sensor 97 is relatively carried out to the shape of a step to the reflection copy on platen glass 100 by this, and vertical scanning of a line sensor 97 is performed.
[0066] On the other hand, the optical block 51 is fixed to a reading orientation at the time of reading of a roll film 21. In this condition, micromigration of the roll film 21 is carried out to the shape of a step by revolution actuation of the stepping motor 35 by the side of the transparency manuscript adapter 13 in the feed direction, and vertical scanning of a line sensor 97 is performed by it. Next, the electric configuration of the flat-bed scanner 11 of the 1st operation gestalt is mainly explained with reference to drawing 4 .
[0067] While a central processing unit (henceforth "CPU") 61 is formed, the memory 62 and the interface circuitries (henceforth "IF circuit") 63 and 59 which were connected to this CPU61 through the data bus, the light source actuation circuit 64, the motorised circuit 65, the optical-system actuation circuit 66, the line sensor actuation circuit 67, the digital disposal circuit 68, and A/D converter 69 are formed in the image read station 12 side.
[0068] On the other hand, the magnetic digital disposal circuit 42, the light source actuation circuit 43, the motorised circuits 44 and 45, and the IF circuit 46 are established in the transparency manuscript adapter 13 side. In addition, the IF circuit 46 by the side of the transparency manuscript adapter 13 is electrically connected to the IF circuit 59 by the side of the image read station 12, and the magnetic digital disposal circuit 42 by the side of the transparency manuscript adapter 13, the light source actuation circuit 43, and the motorised circuits 44 and 45 are also connected to CPU61 by the side of the image read station 12 by this.
[0069] In addition, the IF circuits 63 and 59 of the image read station 12 and the IF circuit 46 of the transparency manuscript adapter 13 are SCSI (Small Computer System Interface) responses. Moreover, memory 62 is program memory or a working memory. The IF circuit 46 may be the interface of a bus connection. CPU61 is one side and is connected to the host computer 14 through the IF circuit 63. With input units which carried out the deer and were connected to the host computer 14, such as a keyboard and a mouse If the signal showing the content of the various commands, such as assignment for reading (assignment of whether to read a reflection copy and which manuscript image of a roll film 21), is inputted into CPU61 through the IF circuit 63 CPU61 performs various control by the various actuation circuits (64, 65, --) and digital-disposal-circuit 68 grade which were mentioned above according to the content of this command, and the program set as memory 62.
[0070] Hereafter, the concrete control action by the various actuation circuits (64, 65, --) and digital-disposal-circuit 68 grade which were connected to CPU61 is explained. The light source actuation circuit 43 by the side of the transparency manuscript adapter 13 follows directions of CPU61, and turns on or switches off the source 38 of the illumination light for transparency manuscripts. A deer is carried out, and at the time of reading of a roll film 21, the light source actuation circuit 43 turns on the source 38 of the illumination light, and switches it off at the time of reading of a reflection copy. According to an operation of this light source actuation circuit 43, the flux of light is adjusted as mentioned above, and the light by which outgoing radiation is carried out from the source 38 of the illumination light irradiates the image storage region 22 of a roll film 21 in the shape of a line. The light which penetrated

the roll film 21 at this time reaches the light-receiving side (two or more optoelectric transducers arranged in single dimension) of a line sensor 97 through the projection lens 52, after carrying out incidence to the image read station 12 and being reflected by the reflective mirror 95. Image formation of the manuscript image on a roll film 21 is carried out by this in respect of light-receiving of a line sensor 97.

[0071] On the other hand, the light source actuation circuit 64 by the side of the image read station 12 follows directions of CPU61, and turns on or switches off the source 94 of the illumination light for reflection copies. A deer is carried out, and at the time of reading of a reflection copy, the light source actuation circuit 64 turns on the source 94 of the illumination light, and switches it off at the time of reading of a roll film 21. The flux of light is adjusted according to the optical system which is not illustrated, and the light in which outgoing radiation is carried out from the source 94 of the illumination light by operation of this light source actuation circuit 64 irradiates the reflection copy (graphic display abbreviation) laid on platen glass 100 in the shape of a line. The light reflected with the reflection copy at this time reaches the light-receiving side of a line sensor 97 through the projection lens 52, after being reflected by the reflective mirror 95. Image formation of the manuscript image on a reflection copy is carried out by this in respect of light-receiving of a line sensor 97.

[0072] According to directions of CPU61, at the time of reading of a roll film 21, the optical-system actuation circuit 66 by the side of the image read station 12 adjusts the location of the projection lens 52 so that the transmitted light from a roll film 21 may carry out image formation in respect of light-receiving of a line sensor 97 like the above. Moreover, at the time of reading of a reflection copy, the optical-system actuation circuit 66 adjusts the location of the projection lens 52 so that the light reflected with the reflection copy may carry out image formation in respect of light-receiving of a line sensor 97 like the above.

[0073] Moreover, according to directions of CPU61, the line sensor actuation circuit 67 drives a line sensor 97, and performs control of the incidence time amount (storage time of the charge according to incident light) of the light to two or more optoelectric transducers by which one-dimensional array was carried out, and control which makes the accumulated charge transmit to a digital disposal circuit 68. Here, the actuation which carries out the sequential transfer of the charge accumulated in each optoelectric transducer of a line sensor 97 on a transfer way is equivalent to horizontal scanning. Therefore, the direction of the array of an optoelectric transducer to which a charge is transmitted turns into a main scanning direction. Carrying out a deer, a main scanning direction turns into the 1-dimensional array direction (shaft orientations of a line sensor 97) of an optoelectric transducer.

[0074] The digital disposal circuit 68 connected to the above-mentioned line sensor 97 performs other signal processing while amplifying the picture signal (analog signal) according to the charge from this line sensor 97 according to directions of CPU61. As other signal processing, there are correlation duplex sampling processing, shading compensation processing, dark current amendment processing, parity amendment processing, etc. And a digital disposal circuit 68 outputs the picture signal after [that] being processed to A/D converter 69.

[0075] A/D converter 69 changes the picture signal (analog signal) from a digital disposal circuit 68 into the digital signal of the predetermined number of bits (for example, 8 bits), and outputs it to CPU61 through a data bus as a signal which shows line data. CPU61 stores in memory 62 the signal which shows this line data. And CPU61 outputs the line data stored in memory 62 to a host computer 14 side through the IF circuit 63 if needed.

[0076] Moreover, according to directions of CPU61, at the time of reading of a reflection copy, the motorised circuit 65 by the side of the image read station 12 moves the optical block 51 whole in the direction of vertical scanning in the shape of a step at detailed spacing to platen glass 100, as revolution actuation is carried out and the stepping motor 53 was mentioned above (micromigration). In addition, micromigration of this optical block 51 whole is performed synchronizing with a transfer of the charge within the line sensor 97 by the line sensor actuation circuit 67 mentioned above. It is made to move to the reading orientation which described the optical block 51 above at the time of reading of a roll film 21, and this motorised circuit 65 makes the reading orientation concerned stand it still as it is.

[0077] The motorised circuits 44 and 45 by the side of the transparency manuscript adapter 13 carry out revolution actuation of DC motor 31 and the stepping motor 35 according to directions of CPU61 connected through the IF circuits 46 and 59 and a data bus. A deer is carried out, at the time of reading of a roll film 21, the motorised circuit 44 carries out revolution actuation to a forward revolution or counterrotation, and the fork shaft 39 and receiving spool 32 which were connected with this DC motor 31 interlock, and it rotates DC motor 31. Therefore, it is fed with a roll film 21 in the feed direction, being sent out from a cartridge 15 and rolled round by the receiving spool 32, or it is fed with it towards reverse and it is rewound by the cartridge 15.
[0078] Feed of the roll film 21 by such DC motor 31 is performed at a rate quick for for example, coma migration in addition to reading of the image of a roll film 21. Moreover, at the time of feed of the roll film 21 by DC motor 31, a tension roller 33 separates from the scanning roller 34 slightly, and is arranged. This is for preventing a roll film 21 and the scanning roller 34 being worn, and damaging each other while making smooth passage of the roll film 21 at the time of feed.
[0079] And the motorised circuit 45 of another side carries out revolution actuation of the stepping motor 35 in the condition that this feed is stopped, according to directions of CPU61, and makes the micromigration of the scanning roller 34 carry out in the feed direction at detailed fixed spacing, as mentioned above. At this time, a tension roller 33 is energized towards the scanning roller 34, and micromigration is similarly carried out. Micromigration of the roll film 21 is carried out in the feed direction at detailed fixed spacing by the micromigration of these tension rollers 33 and the scanning roller 34.
[0080] In addition, micromigration of the above-mentioned roll film 21 is performed synchronizing with transfer control of the charge within the line sensor 97 by the line sensor actuation circuit 67 mentioned above at the time of reading of the image of a roll film 21, and R/W of magnetic information. Moreover, the sensor 36 for film location detection formed in the transparency manuscript adapter 13 side detects the perforation 23 and 24 on a roll film 21 at the time of the feed by DC motor 31 of a roll film 21. CPU61 recognizes the coma number of the roll film 21 actually located in imagination roll film feed side 13C based on the signal acquired from the sensor 36 for film location detection at this time.
[0081] According to directions of CPU61, at the time of the micromigration of the roll film 21 by the stepping motor 35, the magnetic digital disposal circuit 42 by the side of the transparency manuscript adapter 13 drives the magnetic head 37, and read the magnetic information on the magnetic storage field 25 of a roll film 21, information is newly written in the magnetic storage field 25, or it carries out it. At the time of reading of magnetic information, the magnetic digital disposal circuit 42 digitizes the signal showing the read magnetic information, and outputs it to CPU61.
[0082] CPU61 stores the magnetic information which the given signal shows in memory 62. And CPU61 outputs suitably the magnetic information stored in memory 62 to a host computer 14 side through the IF circuit 63 if needed. In the above configuration, the response relation between a claim and the 1st operation gestalt is as follows. Platen glass 100 corresponds to a manuscript installation base. The projection lens 52, a line sensor 97, a substrate 98, the optical-system actuation circuit 66, the line sensor actuation circuit 67, a digital disposal circuit 68, and A/D converter 69 correspond to a reading means.
[0083] A belt 54, a pulley 55, a stepping motor 53, and the motorised circuit 65 correspond to a migration means. A roll film 21 is equivalent to a long film. The fork shaft 39, DC motor 31, a receiving spool 32, a tension roller 33, the scanning roller 34, a stepping motor 35, and the motorised circuits 44 and 45 correspond to a conveyance means.
[0084] The source 38 of the illumination light and the light source actuation circuit 43 correspond to a lighting means. The transparency manuscript adapter 11 is equivalent to a transparency manuscript adapter. The projection lens 52 corresponds to image formation optical system. A line sensor 97 corresponds to a photo-electric-translation means. The optical-system actuation circuit 66 corresponds to an accommodation means. The magnetic head 37 and the magnetic digital disposal circuit 42 correspond to a magnetic information reading means and a magnetic information write-in means.
[0085] Next, actual actuation of the flat-bed scanner 11 of the 1st operation gestalt is explained. The

flat-bed scanner 11 of the 1st operation gestalt can read the image of both a reflection copy (graphic display abbreviation) and the roll film 21, as mentioned above. Hereafter, each reading actuation is explained in order. In reading a roll film 21, a user inputs the information showing the number of the coma (assignment coma) which wants to read a roll film 21 while inputting the information which shows that a reading object is a roll film 21 using the input unit of a host computer 14. Just before or after this, a user opens the closing motion lid 16 of the transparency manuscript adapter 13, and loads a flat-bed scanner 11 with a cartridge 15.

[0086] A host computer 14 sends the signal which shows information, such as information which was inputted from the input unit, and which reads and expresses an object, and a number of an assignment coma, as a roll film reading command to CPU61 of the image read station 12 through the IF circuit 63. CPU61 drives the light source actuation circuit 64, and switches off the source 94 of the illumination light while it receives the roll film reading command given from a host computer 14 and makes memory 62 memorize the number of an assignment coma.

[0087] Furthermore, drive the motorised circuit 65, it is made to move to the reading orientation which described the optical block 51 above, and CPU61 makes the reading orientation concerned stand it still. Moreover, when CPU61 drives the optical-system actuation circuit 66 and the transmitted light from a roll film 21 reaches the light-receiving side of a line sensor 97, the manuscript image on a roll film 21 adjusts the location of the projection lens 52 in accordance with the optical axis so that image formation may be carried out in respect of the light-receiving concerned.

[0088] On the other hand, CPU61 carries out revolution actuation of DC motor 31, and it recognizes the coma number of the roll film 21 actually located in roll film feed side 13C based on the signal from the sensor 36 for film location detection, sending out and feeding with a roll film 21 from a cartridge 15. CPU61 stops feed of the roll film 21 by DC motor 31, when the recognized coma number is in agreement with the number of the assignment coma memorized by memory 62.

[0089] Then, CPU61 carries out revolution actuation of the stepping motor 35, and the starting position of the image storage region 22 of a coma specified from the host computer 14 with the tension roller 33 and the scanning roller 34 carries out micromigration of the roll film 21 until it comes to an image reading location (location where the flux of light from the source 38 of the illumination light and roll film feed side 13C cross).

[0090] Subsequently, CPU61 drives the light source actuation circuit 43 according to a roll film reading command, and turns on the source 38 of the illumination light. After the light from the source 38 of the illumination light penetrates the starting position of the image storage region 22 of a roll film 21 in the shape of a line (one line) at this time and being reflected by the reflective mirror 95, incidence is carried out to the light-receiving side of a line sensor 97 with the projection lens 52.

[0091] CPU61 drives the line sensor actuation circuit 67, a digital disposal circuit 68, and A/D converter 69, and while obtaining a picture signal (analog signal) (horizontal scanning), after [which has the shape of a line of an assignment coma] changing this picture signal into a digital signal, it outputs them to a host computer 14. CPU61 is performed carrying out revolution actuation of the stepping motor 35 for such reading actuation of a line-like picture signal, and making the micromigration of the roll film 21 carry out in the feed direction. This micromigration is performed toward a termination location from the starting position of the image storage region 22 set as the object of reading at a present stage.

[0092] If reading actuation of a line-like picture signal is performed to the termination location of this image storage region 22 (vertical scanning), reading actuation of this image storage region 22 will be ended, and one two-dimensional screen will be obtained. And a host computer 14 displays the image of this one read screen in monitor display etc. (graphic display abbreviation). By roll film reading command, CPU61 repeats the actuation mentioned above until it finished reading all the images about the assignment coma of these plurality, when two or more assignment coma is memorized by memory 62.

[0093] If it is checked by the host computer 14 side that reading of all coma has been completed, an ejection command will newly be inputted into CPU61 from this host computer 14. When this ejection command is received, CPU61 carries out reversal actuation of DC motor 31, feeds with a roll film 21,

and rewinds it in a cartridge 15. After this rewinding is completed, a user can open the closing motion lid 16 and can take out the cartridge 15 concerned from cart room 13A.
[0094] In addition, although magnetic information, such as photography conditions CPUs61 are remembered to be to the magnetic storage field 25 of a roll film 21, is read by the magnetic head 37 at the time of reading of a roll film 21, this magnetic information is further sent to a host computer 14. Carrying out a deer, a host computer 14 computes the optimal image quality amendment parameter, and becomes possible [performing the optimal image quality amendment for the read image] from this acquired magnetic information. Moreover, it is also possible to use the magnetic head 37 for reverse and to write the parameter used for the image quality amendment at this time in the magnetic storage field 25 of a roll film 21.
[0095] On the other hand, in reading a reflection copy, using the input unit of a host computer 14, a user inputs the information which shows that a reading object is a reflection copy, changes the transparency manuscript adapter 13 into an open beam condition, and lays a reflection copy on platen glass 100. A host computer 14 sends the information inputted from the input unit as a reflection copy reading command to CPU61 of the image read station 12 through the IF circuit 63.
[0096] CPU61 receives the reflection copy reading command from a host computer 14, and when the light reflected with the reflection copy reaches the light-receiving side of a line sensor 97, it adjusts the location of the projection lens 52 in accordance with the optical axis by the optical-system actuation circuit 66 so that the manuscript image of a reflection copy may carry out image formation in respect of the light-receiving concerned, while it drives the light source actuation circuit 43 and switches off the source 38 of the illumination light for transparency manuscripts.
[0097] Furthermore, CPU61 carries out revolution actuation of the stepping motor 53, drives the light source actuation circuit 64, and turns on the source 94 of the illumination light for reflection copies while moving the optical block 51 to the reading starting position (while edge concerning [for example,] the direction of vertical scanning of platen glass 100) in the end side of a reflection copy. At this time, the light from the source 94 of the illumination light irradiates the reading starting position of a reflection copy in the shape of a line, and after being reflected by the reflective mirror 95, incidence of the reflected light in the reading starting position of this reflection copy is carried out to the light-receiving side of a line sensor 97 with the projection lens 52.
[0098] Like the time of reading of a roll film 21, CPU61 drives the line sensor actuation circuit 67, a digital disposal circuit 68, and A/D converter 69, and outputs the picture signal of the shape of a line of a reflection copy to a host computer 14. CPU61 is performed carrying out revolution actuation of the stepping motor 53 for such reading actuation of a line-like picture signal, and making the micromigration of the optical block 51 carry out in the direction of vertical scanning. This micromigration is performed from the reading starting position of a reflection copy toward the reading termination location (for example, other-end section of platen glass 100) of an opposite hand with this.
[0099] If reading actuation of a line-like picture signal is performed to the reading termination location of this reflection copy, reading actuation of this reflection copy will be ended and one two-dimensional screen will be obtained. And a host computer 14 displays the image of this one read screen on the monitor display of a graphic display abbreviation for example. Thus, according to the flat-bed scanner 11 of the 1st operation gestalt, not only a reflection copy but the image of the roll film 21 contained by the cartridge 15 can be easily read only by equipping this with the transparency manuscript adapter 13.
[0100] Moreover, in the flat-bed scanner 11 of the 1st operation gestalt, without contacting the manuscript installation side of platen glass 100, at the time of reading of a roll film 21, since micromigration is carried out, it is lost feed or that a film plane and platen glass 100 damage mutually, and suit of a roll film 21. Furthermore, in the flat-bed scanner 11 of the 1st operation gestalt, according to an operation of CPU61 and the optical-system actuation circuit 66, since the location of the projection lens 52 can be adjusted suitably, the location of a manuscript image can always read the manuscript image in the reflection copy laid on the manuscript installation side of platen glass 100, and its manuscript installation side vividly to a mutually different reading object like the roll film 21 with which only the predetermined distance D is located up.

[0101] In addition, what is necessary is just to constitute the flat-bed scanner 11 of the 1st operation gestalt so that micromigration of the above-mentioned source 38 of the illumination light may be carried out synchronizing with the micromigration of the optical block 51 if the image of transparence manuscripts, such as 35mm film, is read although the image of a reflection copy and a roll film 21 is read. moreover -- the flat-bed scanner 11 of the 1st operation gestalt -- as the source 38 of the illumination light -- a line -- although the thing of luminescence was assumed, it is the thing of field-like luminescence and can also constitute. When it is the thing of field-like luminescence and constitutes the source 38 of the illumination light, it can also constitute from a two-dimensional area sensor instead of a line sensor 97. It becomes unnecessary in this case, to perform micromigration for vertical scanning that what is necessary is just to carry out the transfer control of the film per coma.
[0102] In addition, with the above-mentioned 1st operation gestalt, although the micromigration of the roll film 21 by the tension roller 33, the scanning roller 34, and the stepping motor 35 is made to perform vertical scanning, with DC motor 31, micromigration of the roll film 21 concerned may be carried out, and the vertical scanning may be performed. In this case, if it has the device which a roll film 21 winds, and grows fat and controls the bearer rate of DC motor 31 according to **********, the micromigration of the shape of a step by DC motor 31 concerned can be attained with a sufficient precision.
[0103] Moreover, as long as it makes possible micromigration of the shape of a step of the roll film 21 by DC motor 31 in this way, it may be made to write magnetic information, carrying out micromigration of the shape of this step.
(The 2nd operation gestalt) Next, the flat-bed scanner 71 of the 2nd operation gestalt of this invention is explained. Drawing 5 is the cross-section perspective drawing of the internal configuration of the flat-bed scanner 71 of the 2nd operation gestalt. Drawing 6 is the block diagram showing the electric configuration of the flat-bed scanner 71 of the 2nd operation gestalt. In addition, the 2nd operation gestalt corresponds to claims 1, 3, and 4, claim 6 - claim 8, claim 14, and invention according to claim 16 to 19.
[0104] Although the flat-bed scanner 71 of this 2nd operation gestalt can read the image of both a reflection copy and the roll film 21 like the 1st operation gestalt, the condition of having loaded the transparency manuscript adapter 73 with the roll film 21 is shown in drawing 5 and drawing 6 for convenience. The flat-bed scanner 71 of this 2nd operation gestalt is the following point, and differs from the flat-bed scanner 11 of the 1st operation gestalt. That is, the flat-bed scanner 71 of the 2nd operation gestalt is fixed at the time of reading of a roll film 21, without carrying out micromigration of the roll film 21 concerned. And the two-dimensional image of the image storage region 22 of that roll film 21 is obtained in this condition by carrying out micromigration of the optical block 51 side in the feed direction.
[0105] Therefore, the tension roller 33, the scanning roller 34, and stepping motor 35 (refer to drawing 3 and drawing 4) which are used in order to carry out micromigration of this by the flat-bed scanner 11 of the 1st operation gestalt at the time of reading of a roll film 21 are not formed in the flat-bed scanner 71 of the 2nd operation gestalt. Furthermore, as a source of the illumination light used by the flat-bed scanner 71 of the 2nd operation gestalt, the thing of field-like luminescence which can illuminate simultaneously one image storage region 22 of a roll film 21 at least is used (drawing 5 , area-light unit 74 shown in drawing 6).
[0106] in addition, instead of [of the field-like luminescence light source] -- a line -- the luminescence light source may be used. in that case, CPU61 -- a line -- it controls to move the luminescence light source and the optical block 51 synchronously. And incidence of the light of the location where a roll film 21 is illuminated is carried out to a line sensor 97. In addition, about reading of the reflection copy in the flat-bed scanner 71 of the 2nd operation gestalt, it is the same as the 1st operation gestalt. Moreover, the appearance configuration of the flat-bed scanner 71 of the 2nd operation gestalt is the same as the flat-bed scanner 11 of the 1st operation gestalt shown in drawing 1 . Furthermore, the internal configuration of the image read station 72 which constitutes the flat-bed scanner 71 of the 2nd operation gestalt is the same as the image read station 12 of the flat-bed scanner 11 of the 1st operation

gestalt.
[0107] Hereafter, the internal configuration of the flat-bed scanner 71 of the 2nd operation gestalt is explained using drawing 5 and drawing 6 . In addition, in drawing 5 and drawing 6 , the same sign is given to the same thing as the component shown in drawing 3 and drawing 4 , and the explanation is omitted suitably. Between them, cart room 73A and film storage space 73B open spacing in which two or more (a part for for example, three coma above) image storage regions 22 of a roll film 21 are included at the time of loading of a cartridge 15, and are arranged at the transparency manuscript adapter 73 of the flat-bed scanner 71 of the 2nd operation gestalt.
[0108] Moreover, two film support rollers 75 and 76 are arranged in the upper part of field (imagination roll film feed side) 73C where the film plane of a roll film 21 is located in the transparency manuscript adapter 73 at the time of loading of a cartridge 15. These film support rollers 75 and 76 are movable in a vertical direction to imagination roll film feed side 73C. Furthermore, between them, predetermined spacing is opened and the film support rollers 75 and 76 are arranged so that three image storage regions 22 of a roll film 21 (a part for three coma) may be included, for example.
[0109] Therefore, at the time of loading of a cartridge 15, two or more image storage regions 22 (at the example shown in drawing 6 , they are three image storage regions 22) of the roll film 21 located between two film support rollers 75 and 76 can be held in the condition of having pushed on the manuscript installation side of platen glass 100, or it can hold in the condition of having deserted. In addition, the condition of having pushed against drawing 5 is shown.
[0110] Furthermore, the area-light unit 74 is formed above roll film feed side 73C at the transparency manuscript adapter 73. This area-light unit 74 consists of the light emitting diodes and the diffusion plates which carried out two-dimensional array, for example. In this case, the light of light emitting diode shape[of a field]-emits light through a diffusion plate. This area-light unit 74 is formed in the magnitude which can illuminate simultaneously all the image storage regions 22 (a part for for example, three coma) of the roll film 21 located between two film support rollers 75 and 76 as shown in drawing 6 . Hereafter, the range on the roll film 21 which may be illuminated with the area-light unit 74 is called "range for reading."
[0111] In addition, the sensor 36 for film location detection and the magnetic head 37 are formed in the outside of the range for reading. At the flat-bed scanner 71 constituted as mentioned above, micromigration of the optical block 51 is carried out to the shape of a step at detailed spacing fixed in the feed direction by the revolution actuation of a stepping motor 53 prepared in the image read station 72 in the time of reading of a roll film 21 as well as the time of reading of a reflection copy. That is, micromigration of the line sensor 97 will be relatively carried out to the shape of a step to the roll film 21 in the transparency manuscript adapter 73, and vertical scanning accompanying migration of a line sensor 97 will be performed.
[0112] Next, with reference to drawing 6 , the electric configuration of the flat-bed scanner 71 of the 2nd operation gestalt is explained. The magnetic digital disposal circuit 42, the light source actuation circuit 78, the support roller actuation circuit 79, the motorised circuit 44, and the IF circuit 46 are established in the transparency manuscript adapter 73 side, and these are connected to CPU61 through the IF circuit 59 by the side of the image read station 72, and a data bus.
[0113] The light source actuation circuit 78 follows directions of CPU61, and turns on or switches off the area-light unit 74. A deer is carried out, and at the time of reading of a roll film 21, the light source actuation circuit 78 turns on the area-light unit 74, and switches it off at the time of reading of a reflection copy. The light by which outgoing radiation is carried out from the area-light unit 74 at the time of reading of a roll film 21 illuminates simultaneously two or more whole image storage regions 22 (a part for for example, three coma) of the roll film 21 located in within the limits for reading. The light which penetrated the roll film 21 at this time reaches the light-receiving side of a line sensor 97 through the projection lens 52, after carrying out incidence to the image read station 72 and being reflected by the reflective mirror 95. In this case, a line sensor 97 chooses only the light which penetrated some fields (line-like field) of a roll film 21, and is made to result in that light sensing portion. And image formation of the manuscript image on the roll film 21 corresponding to the field of the shape of an above-

mentioned line is carried out by operation of the projection lens 52 in respect of this light-receiving.
[0114] Thus, some fields (line-like field) of the roll film 21 chosen as a result by the line sensor 97 meet in the single dimension array direction of two or more optoelectric transducers of a line sensor 97. Moreover, some above-mentioned fields are appointed by the roll film 21 at this time, and the relative location of the optical block 51. That is, according to the location of the optical block 51, the field of the shape of a part of line will be chosen from the field of the shape of a field of a roll film 21.
[0115] On the other hand, the support roller actuation circuit 79 moves the film support rollers 75 and 76 in the direction (drawing 5 , the vertical direction of drawing 6) vertical to imagination roll film feed side 73C according to directions of CPU61. Carrying out a deer, the support roller actuation circuit 79 moves the film support rollers 75 and 76 caudad at the time of reading of a roll film 21. At this time, the film support rollers 75 and 76 push against the manuscript installation side of platen glass 100 the roll film 21 actually located in roll film feed side 73C, and hold this condition.
[0116] Moreover, at the time of feed of the roll film 21 by revolution actuation of DC motor 31, the support roller actuation circuit 79 moves the film support rollers 75 and 76 to an orientation (upper predetermined location of roll film feed side 73C), and is made into the condition of having separated the roll film 21 from the manuscript installation side of platen glass 100. In the above configuration, the response relation between a claim and the 2nd operation gestalt is as follows. Platen glass 100 corresponds to a manuscript installation base. The projection lens 52, a line sensor 97, a substrate 98, the optical-system actuation circuit 66, the line sensor actuation circuit 67, a digital disposal circuit 68, and A/D converter 69 correspond to a reading means. A belt 54, a pulley 55, a stepping motor 53, and the motorised circuit 65 correspond to a migration means.
[0117] A roll film 21 is equivalent to a long film. The fork shaft 39, DC motor 31, a receiving spool 32, and the motorised circuit 44 correspond to a conveyance means. The area-light unit 74 and the light source actuation circuit 78 correspond to a lighting means. The transparency manuscript adapter 73 is equivalent to a transparency manuscript adapter. The projection lens 52 corresponds to image formation optical system. A line sensor 97 corresponds to a photo-electric-translation means. The optical-system actuation circuit 66 corresponds to an accommodation means. The film support rollers 75 and 76 and the support roller actuation circuit 79 correspond to a film centering-control means. The magnetic head 37 and the magnetic digital disposal circuit 42 correspond to a magnetic information reading means and a magnetic information write-in means.
[0118] Next, actual actuation of the flat-bed scanner 71 of the 2nd operation gestalt is explained. Although the flat-bed scanner 71 of the 2nd operation gestalt can read the image of both a reflection copy (graphic display abbreviation) and the roll film 21 as mentioned above, about reading of a reflection copy, since it is the same as that of the 1st operation gestalt, it omits the explanation, and explains only reading actuation of a roll film 21.
[0119] In reading a roll film 21 by the flat-bed scanner 71 of the 2nd operation gestalt, a user inputs the information which shows the number of the coma (assignment coma) which wants to read a roll film 21 while inputting the information which shows that a reading object is a roll film 21 from the input unit of a host computer 14 like the case of the 1st operation gestalt. A flat-bed scanner 71 is loaded with a cartridge 15 just before or after this.
[0120] A host computer 14 sends the information that it was inputted from the input unit, such as a number of an assignment coma, to CPU61 as a roll film reading command. CPU61 which received the roll film reading command makes the light source actuation circuit 64 switch off the source 94 of the illumination light while making memory 62 memorize the number of an assignment coma.
[0121] Furthermore, CPU61 carries out revolution actuation of DC motor 31, and it recognizes the coma number of the roll film 21 actually located in imagination roll film feed side 13C based on the signal from the sensor 36 for film location detection, sending out and feeding with a roll film 21 from a cartridge 15. When in agreement with the number of the assignment coma the recognized coma number was remembered to be by memory 62, CPU61 judges that the assignment coma is located in within the limits the film support roller 75 and for [between 76] reading, and stops a roll film 21.
[0122] Subsequently, CPU61 directs in the support roller actuation circuit 79, and makes a roll film 21

pushed on the manuscript installation side of platen glass 100 according to a roll film reading command. On the other hand, when the transmitted light from a roll film 21 reaches the light-receiving side of a line sensor 97, CPU61 makes the optical-system actuation circuit 66 move the projection lens 52 in the direction of an optical axis, and performs the centering control in it so that the manuscript image of a roll film 21 may carry out image formation in respect of the light-receiving concerned.

[0123] Moreover, CPU61 turns on the area-light unit 74 by the light source actuation circuit 78. At this time, the light from the area-light unit 74 illuminates simultaneously two or more whole image storage regions 22 (a part for for example, three coma) of the roll film 21 located in within the limits for [above mentioned] reading. Furthermore, CPU61 carries out revolution actuation of the stepping motor 53, moves the optical block 51 in the shape of a step, and it moves the optical block concerned to a position so that the light of the shape of a line which penetrated the starting position of the image storage region 22 of an assignment coma may reach the light-receiving side of a line sensor 97.

[0124] With the line sensor actuation circuit 67, a digital disposal circuit 68, and A/D converter 69, after CPU61 changes the picture signal (analog signal) of the shape of a line of an assignment coma into a digital signal, it is outputted to a host computer 14 side.

[0125] CPU61 carries out revolution actuation of the stepping motor 53 for such reading actuation of a line-like picture signal, and it performs it, moving the optical block 51 in the feed direction in the shape of a step at detailed fixed spacing (micromigration). This micromigration is read at a present stage and performed toward a termination location from the starting position of the image storage region 22 of the target roll film 21.

[0126] If reading actuation of a line-like picture signal is performed to the termination location of this image storage region 22, reading actuation of this image storage region 22 will be ended, and one two-dimensional screen will be obtained. And a host computer 14 displays the image of this one read screen on monitor display. Subsequently, in a present stage, if CPU61 has the assignment coma otherwise memorized by memory 62, it will repeat image reading actuation of the assignment coma mentioned above, and will perform it to within the limits for reading.

[0127] CPU61 repeats the actuation mentioned above about all assignment coma until it finished reading an image, when two or more coma is specified at the time of a roll film reading command. After reading of all assignment coma is completed, CPU61 receives the ejection command from a host computer 14, and performs actuation which rewinds a roll film 21 in a cartridge 15.

[0128] In addition, like the 1st operation gestalt, in case the manuscript image on a roll film 21 is read, it is also possible to read magnetic information, such as photography conditions memorized to the magnetic storage field 25 of a roll film 21, by the magnetic head 37, to perform image quality amendment and to write in the amendment parameter at this time reversely to the magnetic storage field 25 based on this read information.

[0129] According to the 2nd operation gestalt, with the film support rollers 75 and 76, as explained above, when reading a roll film 21, since a coma in the range in which image reading is possible is forced on the manuscript installation side of platen glass 100, it can read the manuscript image on a roll film 21, and, moreover, can perform the reading vividly in the same focal location as the case where a reflection copy (graphic display abbreviation) is read.

[0130] Moreover, when feeding with a roll film 21, since the feed is performed in the upper part (imagination roller film feed side 73C) where the roll film 21 separated from the manuscript installation side of the platen glass 100 of the image read station 12, without performing forcing with the film support rollers 75 and 76, it can prevent attaching a blemish to a film plane.

[0131] Furthermore, while two or more coma (a part for three coma [An operation gestalt]) is included within limits inserted between two film support rollers 75 and 76 according to the 2nd operation gestalt With the area-light unit 74, since all of two or more of these coma were illuminated In performing vertical scanning for reading the manuscript image on a roll film 21, the coma of these plurality can be suitably read only by it becoming unnecessary to feed with the roll film 21 concerned, and carrying out micromigration of the optical block 51.

[0132] In addition, the flat head scanner 71 of the 2nd operation gestalt can also be used for reading of

the usual 35mm film as it is, when not loaded with the cartridge 15. In addition, since a film plane is forced on the manuscript installation side of platen glass 100 with the 2nd operation gestalt when reading a roll film 21, the focal location of the projection lens 52 is the same as the time of reading a reflection copy or the usual transparency manuscript. Therefore, the device (optical-system actuation circuit 66) in which the location of the projection lens 52 prepared with the 2nd operation gestalt is adjusted is also omissible.

[0133] Moreover, although the 2nd above-mentioned example showed the example which constitutes the area-light unit 74 from two or more light emitting diodes, a fluorescent lamp etc. is arranged to the perimeter, and it is [the exterior of the flat-bed scanner 71 concerned] good, as the light of the these-arranged fluorescent lamp is made to result in the transparency manuscript adapter 72 concerned through a diffusion plate also as a source of the illumination light of field-like luminescence.

[0134] (The 3rd operation gestalt) Next, the flat-bed scanner 81 of the 3rd operation gestalt of this invention is explained. Drawing 7 is the cross-section perspective drawing of the internal configuration of the flat-bed scanner 81 of the 3rd operation gestalt. Drawing 8 is drawing explaining arrangement of the presser-foot plate 84 of the transparency manuscript adapter 83 of the 3rd operation gestalt, and the mask plate 85. Drawing 9 is drawing explaining the condition of having pushed the roll film 21 against the mask plate 85 with the presser-foot plate 84. In addition, the 3rd operation gestalt corresponds to claim 1, claim 3, claim 4, claim 6, claim 7, claim 9, claim 10, claim 13, claim 14, and invention according to claim 16 to 19.

[0135] Although the flat-bed scanner 81 of this 3rd operation gestalt can read the image of both a reflection copy and the roll film 21 like the 1st and 2nd operation gestalt, the condition of having loaded the transparency manuscript adapter 83 with the roll film 21 is shown in drawing 7 for convenience. Moreover, like the 2nd operation gestalt, although the flat-bed scanner 81 of this 3rd operation gestalt pushes the roll film 21 concerned against the manuscript installation side of platen glass 100 at the time of reading of a roll film 21, it is replaced with two film support rollers 75 and 76 of the 2nd operation gestalt at the flat-bed scanner 81 of the 3rd operation gestalt, and it differs in that the presser-foot plate 84 is formed.

[0136] In addition, about reading of the reflection copy in the flat-bed scanner 81 of the 3rd operation gestalt, it is the same as the 1st operation gestalt. Moreover, the appearance configuration of the flat-bed scanner 81 of the 3rd operation gestalt is the same as that of the flat-bed scanner 11 of the 1st operation gestalt shown in drawing 1 . Furthermore, the internal configuration of the image read station 82 which constitutes the flat-bed scanner 81 of the 3rd operation gestalt is the same as the image read station 12 of the flat-bed scanner 11 of the 1st operation gestalt.

[0137] Hereafter, the internal configuration of the flat-bed scanner 81 of the 3rd operation gestalt is explained using drawing 7 . In addition, in drawing 7 , the same sign is given to the same thing as the component shown in drawing 3 and drawing 5 , and the explanation is omitted. The presser-foot plate 84 is formed in the upper part of field (imagination roll film feed side) 83C in which the film plane of a roll film 21 is located at the time of feed at the transparency manuscript adapter 83 of the flat-bed scanner 81 of the 3rd operation gestalt. This presser-foot plate 84 becomes perpendicularly movable to the roll film feed side 13C concerned by the presser-foot plate actuation circuit of a graphic display abbreviation, and that position control is performed.

[0138] That is, as shown to drawing 8 by the continuous line, this presser-foot plate 84 is that whole, and is formed in the magnitude which can cover range 21for reading A (a part for three coma [This 3rd operation gestalt]) of a roll film 21 at least. In this case, the presser-foot plate 84 consists of protection-from-light members. Two or more opening 84A (for example, three openings) corresponding to each of two or more image storage regions 22 (for example, image storage region for three coma) in range 21for reading A is formed in this presser-foot plate 84.

[0139] As for opening 84A of this presser-foot plate 84, that magnitude is slightly formed small from the image storage region 22 of a roll film 21. Thus, reading the film plane of the image storage region 22 out of range as image information accidentally at the time of reading of the manuscript image on a roll film 21, by forming opening 84A small slightly from the image storage region 22, even when the

movement magnitude of the direction of vertical scanning of the roll film 21 concerned (the feed direction) shifts a little from a desired location temporarily is lost. A deer is carried out and the magnitude of this opening 84A is determined according to the precision error of control of the direction of vertical scanning of the roll film 21 by the magnitude of said image storage region 22, and CPU61 (the feed direction).

[0140] Further, as shown at drawing 7 , the presser-foot plate 84 concerned is caudad formed for the mask plate 85 of predetermined thickness (D2) in the transparency manuscript adapter 83. Larger opening 85A smaller than the appearance of the presser-foot plate 84 and than range 21for reading A of a roll film 21 is formed in this mask plate 85 (refer to drawing 8).

[0141] A deer will be carried out and all the image storage regions 22 that opening 85A of the mask plate 85 has in range 21for reading A will be included. Thus, when a roll film 21 is caudad pushed against the platen glass 100 side with the presser-foot plate 84 by [of the presser-foot plate 84 of the transparency manuscript adapter 83] forming the mask plate 85, as shown in drawing 9 , this will be fixed in the location where this presser-foot plate 84 will be in the condition that only predetermined spacing (predetermined thickness D2) was separated from platen glass 100 in the roll film 21.

[0142] Thus, in order to complete feed (coma delivery) of a roll film 21 and to perform vertical scanning, in case micromigration of the optical block 51 is carried out at the time of reading of the manuscript image of a roll film 21, the presser-foot plate 84 is pressed against a roll film 21 in advance of this. At this time, the light from the area-light unit 74 passes opening 84A of the presser-foot plate 84 concerned, and illuminates the image storage region 22 of a roll film 21. At this time, the illumination light concerned is shaded in parts other than image storage region 22.

[0143] By the way, the above-mentioned presser-foot plate 84 is moved in the direction (drawing Nakagami down) vertical to imagination roll film feed side 83C by the same drive (graphic display abbreviation) as the film support rollers 75 and 76 of the 2nd operation gestalt. And according to the driving signal from the presser-foot plate actuation circuit of a carrier beam graphic display abbreviation, migration of the perpendicular direction of the presser-foot plate 84 concerned is performed for the drive of this graphic display abbreviation in directions of CPU61.

[0144] A deer is carried out, it is fixed in the condition of having separated two or more image storage regions 22 (a part for three coma) in range 21for reading A of a roll film 21 from the manuscript installation side of platen glass 100 predetermined spacing D2 by vertical movement of this presser-foot plate 84 at the time of the scan of a manuscript image, or the presser-foot plate 84 can be made to desert a roll film 21 thoroughly reversely at the time of feed of a roll film 21.

[0145] In addition, about the electric configuration of the flat-bed scanner 81 of the 3rd operation gestalt, it is the electric configuration and abbreviation identitas of a flat-bed scanner 71 of the 2nd operation gestalt. Namely, about the electric configuration, it differs by the flat-bed scanner 81 in that it is replaced with the presser-foot plate actuation circuit (graphic display abbreviation) which only the support roller actuation circuit 79 established in the flat-bed scanner 71 described above. Therefore, the outline of the electric configuration of a flat-bed scanner 81 is explained hereafter, referring to drawing 6 .

[0146] The presser-foot plate actuation circuit (graphic display abbreviation) established in the transparency manuscript adapter 83 side of a flat-bed scanner 81 is transposed to the support roller actuation circuit 79 of drawing 6 , as described above, and it is connected to CPU61 through a data bus like other actuation circuits. This presser-foot plate actuation circuit moves the presser-foot plate 84 in the direction vertical to the film plane of a roll film 21 according to directions of CPU.

[0147] Migration of the roll film 21 with this presser-foot plate 84 is performed until it will be in the condition that a roll film 21 is pushed against the mask plate 85 at the time of the scan of a manuscript image (to the condition shown in drawing 9). On the other hand, at the time of feed of a roll film 21, a presser-foot plate actuation circuit moves the presser-foot plate 84 above the orientation (imagination roll film feed side 83C), and separates a roll film 21 from the mask plate 85. At this time, the presser-foot plate 84 will be in the condition of having separated from the roll film 21 concerned.

[0148] In the above configuration, the response relation between a claim and the 3rd operation gestalt is

as follows. Platen glass 100 corresponds to a manuscript installation base. The projection lens 52, a line sensor 97, and a substrate 98 correspond to a reading means. A roll film 21 is equivalent to a long film. DC motor 31 and a receiving spool 32 correspond to a conveyance means. The area-light unit 74 corresponds to a lighting means. The transparency manuscript adapter 83 is equivalent to a transparency manuscript adapter.

[0149] The projection lens 52 corresponds to image formation optical system. A line sensor 97 corresponds to a photo-electric-translation means. The presser-foot plate 84 and a presser-foot plate actuation circuit correspond to a film centering-control means. Opening 84A corresponds to the light transmission section. The mask plate 85 corresponds to a mask member. Opening 85A corresponds to opening. The predetermined thickness D2 corresponds to the thickness of a mask member.

[0150] Next, reading actuation of the manuscript image of the flat-bed scanner 81 constituted in this way is explained. In addition, since reading of the reflection copy (graphic display abbreviation) by the flat-bed scanner 81 is the same as that of the 1st operation gestalt, the explanation is omitted. Moreover, although it is the same as that of the 2nd operation gestalt almost about reading of a roll film 21, CPU61 is different in that a presser-foot plate actuation circuit is driven instead of driving the support roller actuation circuit 79. Hereafter, it explains focusing on this point of difference.

[0151] That is, CPU61 drives DC motor 31 based on the command (an assignment coma is shown) from a host computer 14. On the other hand, CPU61 supervises whether it was fed with the assignment coma of a roll film 21 within limits with image reading possible in which based on the signal from the sensor 36 for film location detection. And when CPU61 has recognized having been fed with the assignment coma concerned within limits with image reading possible in which, it stops the feed by DC motor 31.

[0152] Subsequently, according to the content of the roll film reading command from a host computer 14, CPU61 moves the presser-foot plate 84 using a presser-foot plate actuation circuit, and pushes a roll film 21 against the mask plate 85 with this presser-foot plate 84 (film presser-foot condition). As described above, while CPU61 recognizes the location (perforation) of an assignment coma based on the signal from the sensor 36 for film location detection, the exact alignment of the image storage region 22 of a roll film 21 and opening 84A of the presser-foot plate 84 becomes possible by moving a roll film 21. The manuscript image on the image storage region 22 concerned can be read the neither more nor less by pressing a roll film 21 against the mask plate 85 with the presser-foot plate 84 in this condition.

[0153] In this case, the circumference part (NEGABESU section) of the image storage region 22 is pinched between the presser-foot plate 84 and the mask plate 85, and, as for a roll film 21, pressing down by the mask plate 85 of the roll film 21 concerned is performed. Moreover, since the roll film 21 is pressed down by the mask plate 85 with the presser-foot plate 84, the clearance between the same predetermined spacing (D2) as the thickness (D2) of the mask plate 85 concerned will be secured between the image storage region 22 of a roll film 21, and the manuscript installation side of platen glass 100.

[0154] CPU61 doubles the focal location of the projection lens 52 with the film plane of a roll film 21 located above platen glass 100 by the optical-system actuation circuit 66 (refer to drawing 6), when the image storage region 22 of a roll film 21 is held in this way in the condition of having separated from the manuscript installation side (top face) of platen glass 100 predetermined spacing D2. Therefore, the manuscript image on the image storage region 22 concerned performed succeedingly is read minutely, and a clear image can be obtained.

[0155] Subsequently, CPU61 turns on the area-light unit 74 by the light source actuation circuit 78 (refer to drawing 6). In this case, since parts other than image storage region 22 of a roll film 21 (NEGABESU section) are shaded with the presser-foot plate 84, the illumination light from the area-light unit 74 irradiates the image storage region 22 concerned the neither more nor less. By the way, opening 84A of the presser-foot plate 84 is actually formed small slightly from the image storage region 22, as described above. For this reason, the manuscript image on the image storage region 22 concerned will be crawled a little, and that scan will be performed. However, even if it crawls a manuscript image a little, when carrying out incidence of the light which has recognized the NEGABESU section accidentally to be the image recording field 22, and passed the NEGABESU section concerned by slight

gap at the time of the micromigration by DC motor 31 to a line sensor 97, reading of an effective manuscript image will be performed far. Consequently, it is lost that a light unrelated to a manuscript image carries out incidence to a line sensor 97, and the effect of the flare can be prevented.
[0156] Moreover, by not making the illumination light irradiate the NEGABESU section as mentioned above, in case the manuscript image on the image storage region 22 is scanned, proper exposure can be obtained. Although it is necessary to stick the light-shielding film of others [**** / applying this NEGABESU section black, in being usually the configuration that the illumination light is irradiated by the NEGABESU section] in order to eliminate the effect of the flare incidentally or to obtain proper exposure, and it is necessary to perform that protection from light, these need is lost by using the above-mentioned presser-foot plate 84.
[0157] By the way, if few clearances are generated between a transparency manuscript and a manuscript installation side when laying transparency manuscripts, such as a film, in the manuscript installation side of the platen glass 100 of a flat-bed scanner 81 and reading the manuscript image, the following problem will arise. That is, it is known that the light L1 (refer to drawing 9) which penetrated the transparency manuscript, and the light L2 (refer to drawing 9) which once penetrated, reflected on the top face of platen glass 100, and was further reflected with the transparency manuscript will interfere, and the Newton ring will be generated.
[0158] The deer was carried out and the clearance between the predetermined spacing D2 is secured in the flat-bed scanner 81 of this 3rd operation gestalt using the above-mentioned mask plate 85 of the predetermined thickness D2 between the film plane of a roll film 21, and the top face (manuscript installation side) of platen glass 100 at the time of the scan of a manuscript image. Therefore, as shown in drawing 9 , generating of the Newton ring resulting from interference with the light L1 which penetrated the image storage region 22 concerned, and the light L2 reflected by the film plane concerned can be prevented, and a clear image can be obtained.
[0159] In addition, although the above-mentioned 3rd operation gestalt gave and explained the example which prepares opening 84A to the presser-foot plate 84, light transmission nature may be given to this part instead of preparing this opening 84A. Drawing 10 is the cross-section perspective drawing of the internal configuration of a flat-bed scanner 101 showing the modification of the 3rd operation gestalt.
[0160] In this modification, it replaces with the mask plate 85 of the above-mentioned 3rd operation gestalt, and differs from the 3rd operation gestalt concerned in that the glass plate 105 which performed well-known anti Newton ring processing to predetermined field (field equivalent to opening 85A of mask plate 85) 105A is used. This anti Newton ring processing is performed only to the field which presses down the film plane of a glass plate 105.
[0161] Incidentally, anti Newton ring processing performed in this modification is performed on the front face (film plane side of drawing 10) of a glass plate 105 by giving irregularity which is loose about 10 micrometers which does not have an angle in homogeneity. Thus, even if it uses the glass plate 105 with which anti Newton ring processing was performed, generating of the Newton ring can be prevented like the case where the mask plate 85 of the 3rd operation gestalt is used.
[0162] In addition, with the above-mentioned operation gestalt, we decided to use the glass plate 105 which performed anti Newton ring processing. Instead, the transparent plastic which performed anti Newton-rings processing may be used. In addition, the modification of the 3rd operation gestalt corresponds to claim 1, claim 3, claim 4, claim 6, claim 7, claim 11, claim 12, claim 13, claim 14, and invention according to claim 16. As for the response relation with a claim, a glass plate 105 corresponds to a light transmission nature member.
[0163] With the 1st to 3rd operation gestalt explained above, CPU61 was made to perform control of DC motor 31 and stepping motor 35 grade, the sensor 36 for film location detection having detected perforation 23 and 24, and supervising the signal from the sensor 36 for film location detection at this time, when conveying feed, micromigration, etc. of a roll film 21. Instead, while CPU61 supervises the situation of conveyance of a roll film 21 based on the output of a line sensor 97, it may be made to convey the roll film 21 by DC motor 31 and stepping motor 35 grade.
[0164] In addition, the 1st to 3rd [which was explained above] operation gestalt gave and explained the

example using three line sensors as a line sensor, using the source of the white light as a source of the illumination light. Instead, when the source of the white light is used, it considers as the configuration which separates the color of the transmitted light three times with the filters (or dichroic mirror etc.) of three colors of R, G, and B, and it replaces with three line sensors, and you may make it use monochrome image sensors.

[0165] Moreover, it replaces with the source of the white light used with the 3rd operation gestalt from the above 1st, the filter of three colors of R, G, and B is attached in the light emitting diode (or fluorescence tubing) and the source of the white light of three colors of R (red), G (green), and B (blue) as a source of the illumination light, and you may make it generate the light of three colors. In this case, it can replace with the three above-mentioned line sensors, and monochrome image sensors can be used.

[0166] Moreover, in order to obtain the image data of one screen by the color picture When the source 38 of the illumination light is made into three sources of the illumination light at a loan After changing the three luminescent color in order and reading the image reading location of the shape of same line 3 times, You may carry out by the so-called "line sequential" which repeats the actuation to which a roll film 21 is moved by one line, and may carry out by the so-called "field sequential" which reads one screen for every luminescent color.

[0167]

[Effect of the Invention] As mentioned above, in invention indicated to claim 1 A long film is conveyed along a manuscript installation side with the conveyance means with which the transparency manuscript adapter formed in the manuscript installation side side of a manuscript installation base removable was equipped. By one side With illuminating from the direction projected on a manuscript installation side, a long film with a lighting means Since a reading means can read the manuscript image on the long film concerned, it can also read the image of a long film easily with the image reader which can read the image of a reflection copy.

[0168] According to invention according to claim 2, since a long film with a light conveyance means is conveyed, even if it uses the small conveyance means of the force, a long film can be conveyed at a high speed, and the equipment which reads the image of a long film cheaply can be constituted.

[0169] the need of forming other migration means for image reading in conventional equipment separately as a migration means to move a reading means according to invention according to claim 3 -- since -- the equipment which reads the image of a long film cheaply is offered. According to invention according to claim 4, the image of a long film can be read vividly and easily irrespective of the location of the forming face of the image storage region of a long film by accommodation of the optical physical relationship of the forming face of the image storage region of a long film and the light-receiving side of a photo-electric-translation means by the adjustment means.

[0170] According to invention according to claim 5, with an adjustment means, since image formation of the image of the image storage region of a long film is carried out to the light-receiving side of a photo-electric-translation means, it can read the image of a long film vividly and easily irrespective of the location of the forming face of the image storage region of a long film. According to invention according to claim 6, only by equipping with a transparency manuscript adapter the image reader which can read a reflection copy, a long film is conveyed along a manuscript installation side by the conveyance means, it is illuminated from the direction which projects a long film on a manuscript installation side with a lighting means by one side, and a reading means can read the image of a long film easily.

[0171] The image of a long film can be read easily, without according to invention according to claim 7, attaching a blemish to the film plane of a long film, since a conveyance means maintains predetermined distance and conveys a long film from a manuscript installation side. Since it holds in the condition that the film centering-control means held the long film in the condition of having deserted the manuscript installation side, at the time of conveyance, read the image by the reading means, and sometimes pushed the long film concerned in the manuscript installation side according to invention according to claim 8, a blemish cannot be attached to the film plane of a long film at the time of conveyance, but the manuscript image on a long film can be vividly read at the time of reading.

[0172] According to invention according to claim 9, even if it is the case where clear reading of a manuscript image becomes possible and reads a manuscript image by using a mask member using the mask member moreover pressed against a long film, it is lost that a blemish is attached to the film plane of a long film at the time of conveyance. According to invention according to claim 10, even if it is the case where a manuscript image is read using the mask member pressed against a long film, it is lost that a blemish is attached to the film plane of a long film at the time of conveyance.
[0173] According to invention according to claim 11, even if it is the case where clear reading of a manuscript image becomes possible and reads a manuscript image using the light transmission nature member moreover pressed against a long film by using the light transmission nature member to which anti Newton ring processing was performed, it is lost that a blemish is attached to the film plane of a long film at the time of conveyance.
[0174] According to invention according to claim 12, even if it is the case where a manuscript image is read using the light transmission nature member pressed against a long film, it is lost that a blemish is attached to the film plane of a long film at the time of conveyance. According to invention according to claim 13, clear reading of a manuscript image can be easily performed by keeping abbreviation fixed distance maintained for the image storage region of a long film into the part corresponding to the image storage region of a long film to a manuscript installation base using the protection-from-light member in which the light transmission section is formed.
[0175] Since a magnetic information reading means to read the magnetic information on the magnetic storage field of a long film is formed in the transparency manuscript adapter which became independent of the body of an image reader according to invention according to claim 14, the reading precision of magnetic information improves as compared with the case where this magnetic information reading means is arranged in the body of an image reader. according to invention according to claim 15 -- a lighting means -- a line -- power consumption can be lessened by considering as the light source of luminescence.
[0176] According to invention according to claim 16, the configuration of a transparency manuscript adapter can be made simple by making a lighting means into the light source of field-like luminescence. According to invention according to claim 17, the configuration of a transparency manuscript adapter can be made simple by forming a magnetic information reading means in the lighting side side of a long film. Since the magnetic information write-in means which writes magnetic information in the magnetic storage field of a long film is formed in the transparency manuscript adapter which became independent of the body of an image reader according to invention according to claim 18, a write-in precision of magnetic information improves as compared with the case where this magnetic ****** hand hold stage is arranged in the body of an image reader.
[0177] According to invention according to claim 19, the configuration of a transparency manuscript adapter can be made simple by forming a magnetic information write-in means in the lighting side side of a long film.

[Translation done.]

* NOTICES *

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1] It is the external view showing the image reading structure of a system.
[Drawing 2] They are a roll film and the external view of a cartridge.
[Drawing 3] It is the cross-section perspective drawing of the flat-bed scanner of the 1st operation gestalt.
[Drawing 4] It is the electric block diagram of the flat-bed scanner of the 1st operation gestalt.
[Drawing 5] It is the cross-section perspective drawing of the flat-bed scanner of the 2nd operation gestalt.
[Drawing 6] It is the electric block diagram of the flat-bed scanner of the 2nd operation gestalt.
[Drawing 7] It is the cross-section perspective drawing of the flat-bed scanner of the 3rd operation gestalt.
[Drawing 8] It is drawing showing arrangement of the presser-foot plate of the transparency manuscript adapter of the 3rd operation gestalt, and a mask plate.
[Drawing 9] It is drawing explaining the condition of having pushed the roll film 21 against the mask plate 85 with the presser-foot plate 84.
[Drawing 10] It is the cross-section perspective drawing of the flat-bed scanner of the modification of the 3rd operation gestalt.
[Drawing 11] It is the cross-section perspective drawing of the conventional flat-bed scanner.
[Description of Notations]
11, 71, 81, 101, 90 Flat-bed scanner
12 91 Image read station
13, 73, 83 Transparency manuscript adapter
14 Host Computer
15 Cartridge
16 Closing Motion Lid
21 Roll Film
22 Image Storage Region
23 24 Perforation
25 Magnetic Storage Field
26 Case
27 Opening
28 Cartridge Spool
31 DC Motor
32 Receiving Spool
33 Tension Roller
34 Scanning Roller
35 53 Stepping motor
36 Sensor for Film Location Detection

37 Magnetic Head
38 94 Source of the illumination light
51 93 Optical block
52 96 Projection lens
54 Belt
55 Pulley
74 Area-Light Unit
75 76 Film support roller
92 Protection-from-Light Lid
95 Reflective Mirror
97 Line Sensor
98 Substrate
99 Hinge
100 Platen Glass

[Translation done.]

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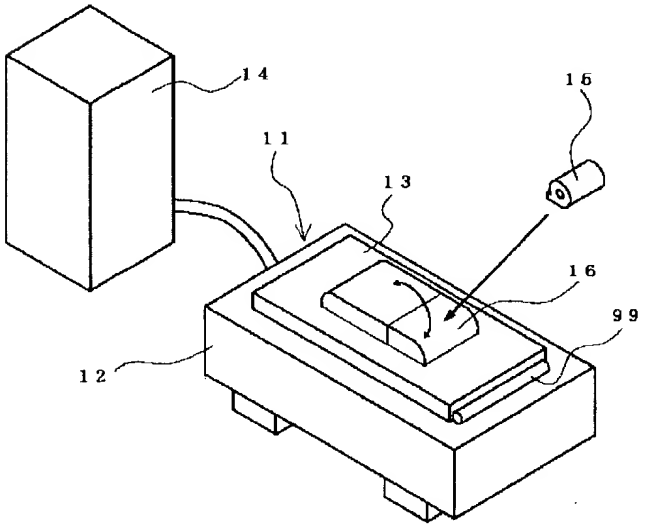
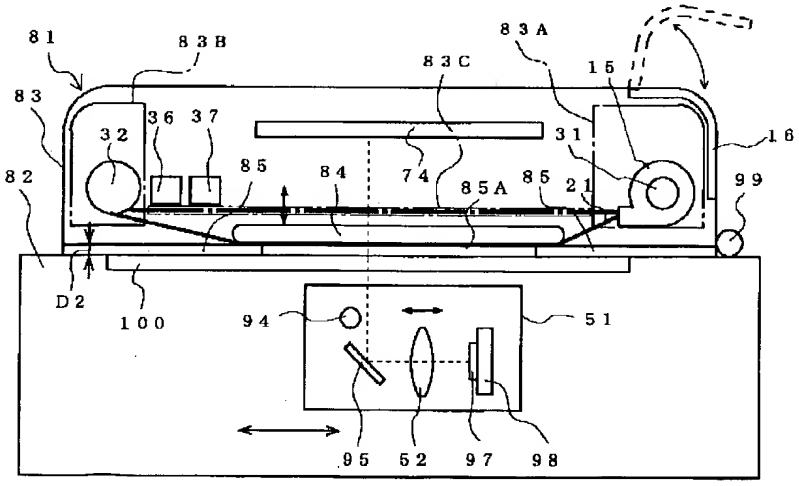
DRAWINGS

[Drawing 1]
画像読取システムの構成を示す外観図

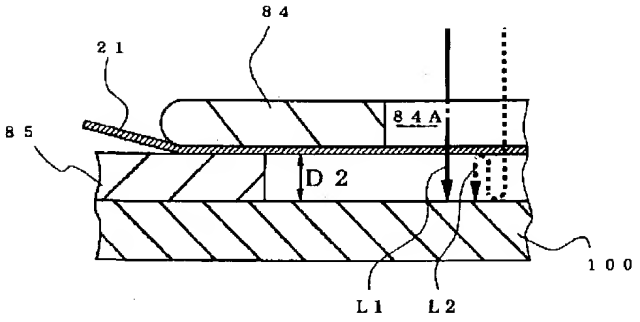


[Drawing 7]
第３実施形態のフラットベッドスキャナの断面透視図



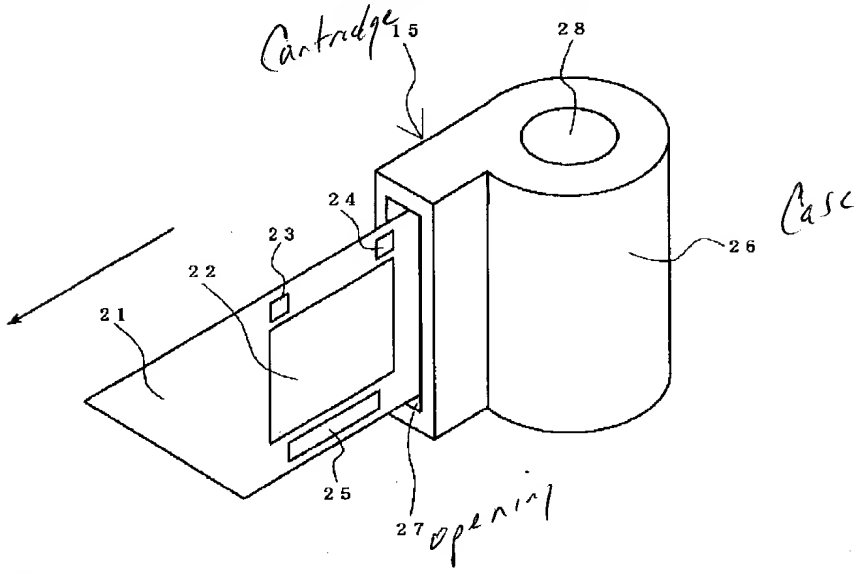
[Drawing 9]

ロールフィルムを押さえ板でマスク板に押し付けた状態を説明する図



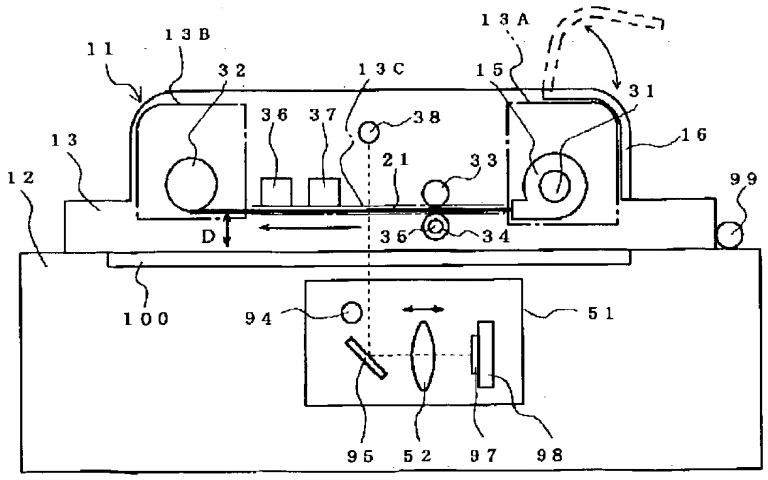
[Drawing 2]

ロールフィルムおよびカートリッジの外観図



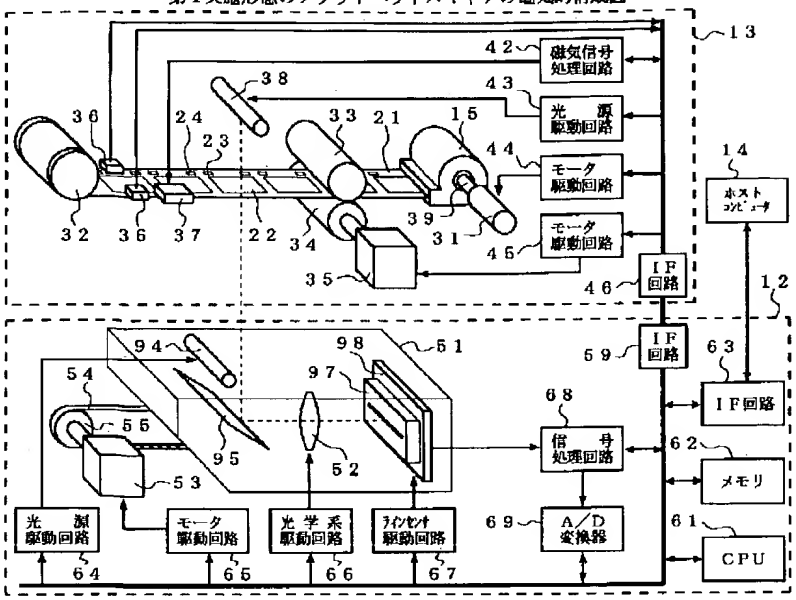
[Drawing 3]

第1実施形態のフラットベッドスキャナの断面透視図



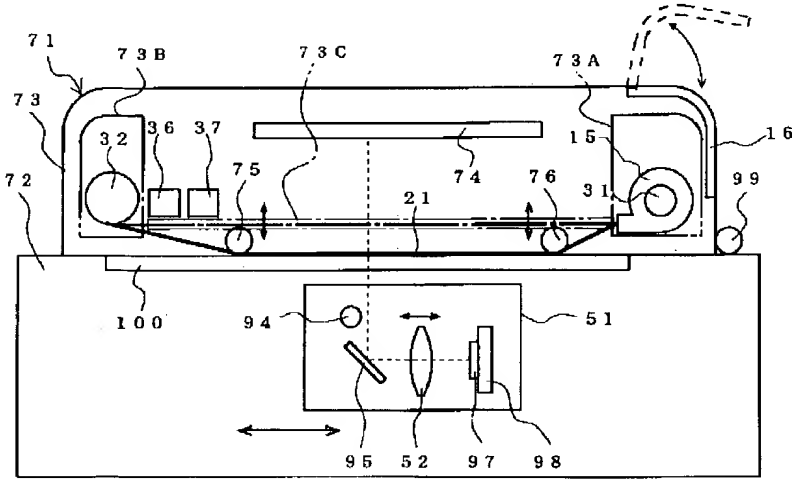
[Drawing 4]

第１実施形態のフラットベッドスキャナの電気的構成図



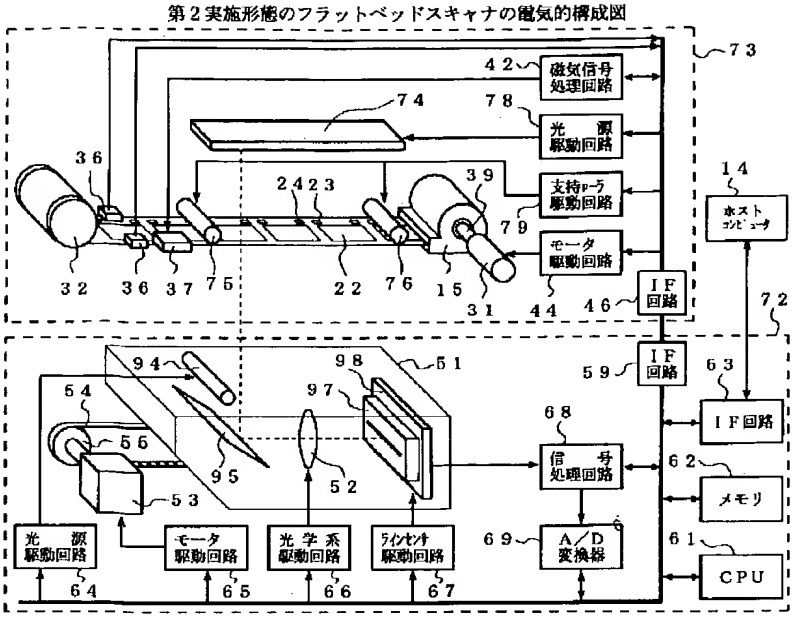
[Drawing 5]

第２実施形態のフラットベッドスキャナの断面透視図



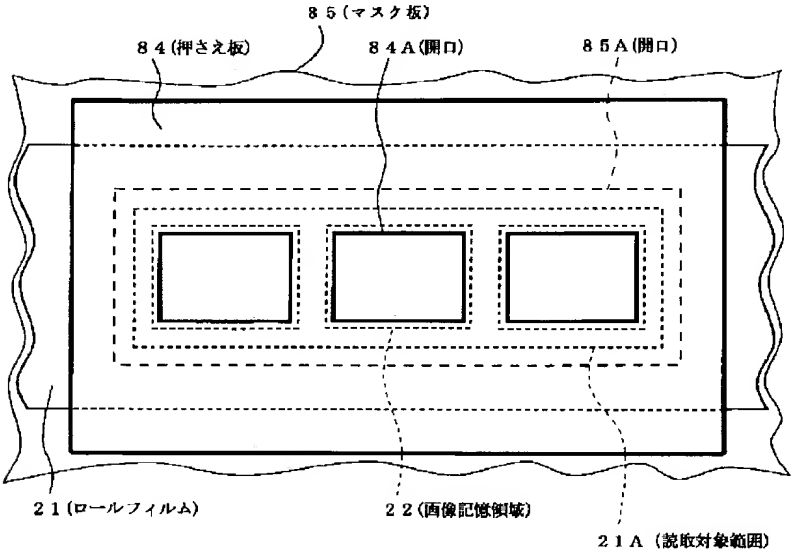
[Drawing 6]

第２実施形態のフラットベッドスキャナの電気的構成図



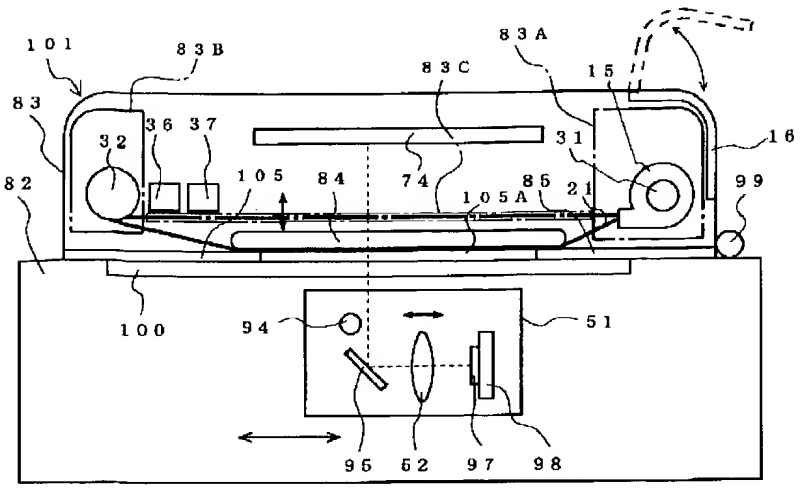
[Drawing 8]

第３実施形態の透過原稿アダプタの押さえ板およびマスク板の配置を示す図



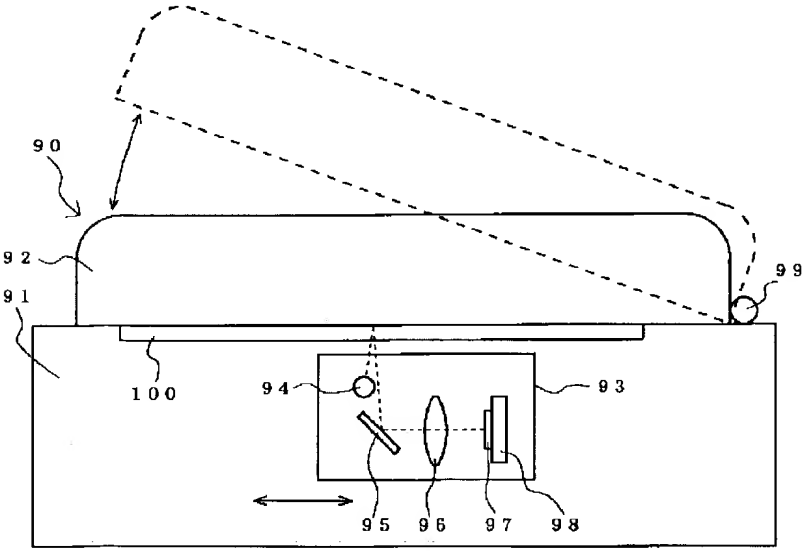
[Drawing 10]

第３実施形態の変形例のフラットベッドスキャナの断面透視図



[Drawing 11]

従来のフラットベッドスキャナの断面透視図



[Translation done.]

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CLAIMS

[Claim(s)]
[Claim 1] The image reader characterized by to have the transparency manuscript adapter which has the manuscript installation base in which a manuscript is laid, a reading means read the image of a manuscript, a conveyance means it is prepared in the manuscript installation side side of said manuscript installation base removable, and convey the long film which is a transparency manuscript along said manuscript installation side, and a lighting means illuminate from the direction which projects said long film on said manuscript installation side.
[Claim 2] The image reader characterized by the aforementioned reading means reading the image of said long film when it has further a migration means to move the aforementioned reading means along said manuscript installation base, in an image reader according to claim 1, said migration means stands the aforementioned reading means still in an orientation and said conveyance means conveys said long film.
[Claim 3] The image reader characterized by for the aforementioned reading means to read the image of said long film when it has further a migration means move the aforementioned reading means along said manuscript installation base, in an image reader according to claim 1, the image storage region where said conveyance means is set as the reading object of said long film is set as an orientation and said migration means moves the aforementioned reading means.
[Claim 4] In an image reader according to claim 1 the aforementioned reading means When it has the image formation optical system which carries out image formation of the image light of a manuscript, and a photo-electric-translation means for it to be arranged in the image formation location of said image formation optical system, and to change into a picture signal the light which carries out incidence and the aforementioned reading means reads the image of said long film The image reader characterized by having further an accommodation means to adjust the optical physical relationship of the forming face of the image storage region of said long film about said image formation optical system, and the light-receiving side of said photo-electric-translation means.
[Claim 5] It is the image reader characterized by doubling the image formation location of said image formation optical system with the location where the image of the image storage region of said long film carries out image formation of said accommodation means to the light-receiving side of said photo-electric-translation means according to said image formation optical system in an image reader according to claim 4.
[Claim 6] The transparency manuscript adapter which carries out [having a conveyance means convey the long film which is the transparency manuscript adapter formed removable in the manuscript installation side side of said manuscript installation base of an image reader equipped with the manuscript installation base in which a manuscript is laid, and a reading means read the image of a manuscript, and is a transparency manuscript along said manuscript installation side, and a lighting means illuminate from the direction which projects said long film on said manuscript installation side, and] as the description.
[Claim 7] It is the transparency manuscript adapter characterized by for said conveyance means

maintaining predetermined distance from said manuscript installation side in a transparency manuscript adapter according to claim 6, and conveying said long film.
[Claim 8] In a transparency manuscript adapter according to claim 6, it has a film centering-control means to adjust the location of said long film to said manuscript installation side. Said film centering-control means When said conveyance means conveys said long film The transparency manuscript adapter characterized by holding said long film in the condition of having pushed against said manuscript installation side when said long film is held in the condition of having deserted said manuscript installation side and the aforementioned reading means reads the image of said long film.
[Claim 9] It is the transparency manuscript adapter which is arranged on said manuscript installation side in a transparency manuscript adapter according to claim 6 when said image reader is equipped, equips the part corresponding to the image storage region of said long film with the mask member which has opening at least, and is characterized by for said conveyance means to maintain a larger predetermined distance than the thickness of said mask member, and to convey said long film from said manuscript installation side.
[Claim 10] It is the mask member arranged on said manuscript installation side in a transparency manuscript adapter according to claim 6 when said image reader is equipped. The mask member which has opening into the part corresponding to the image storage region of said long film at least, It has a film centering-control means to adjust the location of said long film to said mask member. Said film centering-control means When said conveyance means conveys said long film The transparency manuscript adapter characterized by holding said long film in the condition of having pushed against said mask member when said long film is held in the condition of having deserted said mask member and the aforementioned reading means reads the image of said long film.
[Claim 11] In a transparency manuscript adapter according to claim 6, when said image reader is equipped, it is arranged on said manuscript installation side. The part corresponding to the image storage region of said long film is equipped with the light transmission nature member to which anti newton processing is performed at least. Said conveyance means The transparency manuscript adapter characterized by maintaining a larger predetermined distance than the thickness of said light transmission nature member, and conveying said long film from said manuscript installation side.
[Claim 12] In a transparency manuscript adapter according to claim 11, it has a film centering-control means to adjust the location of said long film to said light transmission nature member. Said film centering-control means When said conveyance means conveys said long film The transparency manuscript adapter characterized by holding said long film in the condition of having pushed against said light transmission nature member when said long film is held in the condition of having deserted said light transmission nature member and the aforementioned reading means reads the image of said long film.
[Claim 13] It is the transparency manuscript adapter characterized by having the protection-from-light member by which the light transmission section is formed in the part on a transparency manuscript adapter given in any 1 term of claim 8, claim 10, and claim 12, and corresponding to the image storage region of said long film in said film centering-control means.
[Claim 14] The transparency manuscript adapter characterized by having a magnetic information reading means to read magnetic information in the magnetic storage field of said long film, in a transparency manuscript adapter according to claim 6.
[Claim 15] the line which said lighting means moves in a transparency manuscript adapter according to claim 6 synchronizing with migration of the aforementioned reading means -- the transparency manuscript adapter characterized by having the light source of luminescence.
[Claim 16] It is the transparency manuscript adapter characterized by equipping said lighting means with the light source of field-like luminescence in a transparency manuscript adapter according to claim 6.
[Claim 17] It is the transparency manuscript adapter characterized by forming said magnetic information reading means in the lighting side side of said long film in a transparency manuscript adapter according to claim 14.
[Claim 18] The transparency manuscript adapter characterized by having the magnetic information

write-in means which writes magnetic information in the magnetic storage field of said long film in a transparency manuscript adapter according to claim 6.
[Claim 19] It is the transparency manuscript adapter characterized by forming said magnetic information write-in means in the lighting side side of said long film in a transparency manuscript adapter according to claim 18.

[Translation done.]